Vol. 937 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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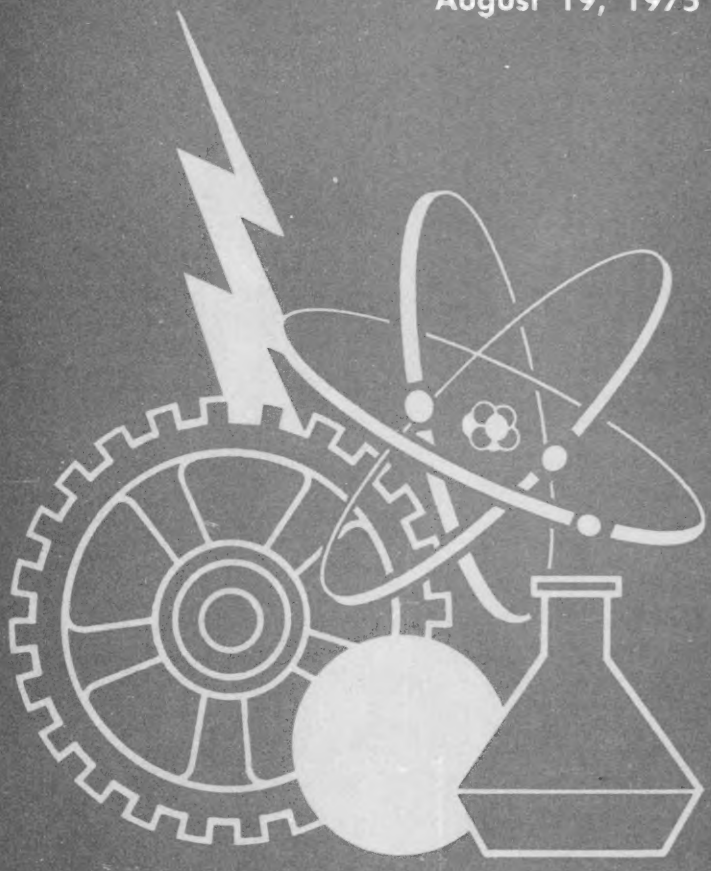

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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

August 19, 1975 Volume 937 Number 3

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,685,536, Ransburg and Starkey, METHOD FOR ELECTROSTATICALLY COATING ARTICLES; **2,794,417,** same, APPARATUS FOR ELECTROSTATICALLY COATING ARTICLES; **2,893,893,** W. W. Crouse, METHOD AND APPARATUS FOR ELECTROSTATIC COATING; **2,893,894,** E. M. Ransburg, METHOD AND APPARATUS FOR ELECTROSTATICALLY COATING, **filed** Mar. 27, 1974, D.C.N.J. (Newark), Doc. C–74–435, *Ransburg Corporation* v. *Ducane Heating Corporation.* Stipulation of dismissal of action, Mar. 17, 1975.

2,794,417. (See 2,685,536.)

2,893,893. (See 2,685,536.)

2,893,894. (See 2,685,536.)

2,897,641, Simon and Thomas, PACKAGING METHODS, **filed** Feb. 13, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c492, *Instapak Corporation* v. *Miller Fluid Power Corp.* **Same, filed** Mar. 10, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c0770, *Instapak Corporation* v. *Haeger Potteries, Inc.*

2,964,079, D. L. Johnson, WOOD FLAKING AND SURFACING MACHINE, **filed** Mar. 21, 1975, D.C., W.D. Wash. (Seattle), Doc. C75–58T, *Donald L. Johnson* v. *Kockum Industries, Inc. et al.*

3,275,316, G. V. Cleary, Jr., INSERT FOR NEWSPAPERS, **filed** Apr. 25, 1975, D.C., S.D.N.Y., Doc. 75–C–1985, *ITT Community Development Corp.* v. *Free Standing Stuffer Inc.*

3,349,426, R. S. Haydock, HOODED CASTER WHEEL ASSEMBLY, **filed** Apr. 23, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1288, *Raymond Haydock, Jr. and Sandra Haydock Neuman* v. *Slidematic Products Co.*

3,358,793, Hollnagel and Hollnagel, COMPACT FLOATING DISC BRAKE, **filed** Apr. 14, 1975, D.C. Minn. (Minneapolis), Doc. 4–75–C 167, *Kelsey-Hayes Company* v. *Tol-O-Matic, Inc.* Plaintiff's dismissal of case, Apr. 21, 1975.

3,400,038, C. D. Burgess, SEAMING TAPE, **filed** Sept. 11, 1968, D.C. Del. (Wilmington), Doc. 3608, *Montgomery Mills Inc. and Consolidated Foods Corp.* v. *Giffen-Burgess Corp., Giffen Industries, Inc. and Giffen Corp.* It is hereby stipulated that all of the above action and claims are dismissed with prejudice against the plaintiffs as to the complaint and with prejudice against the defendants as to the counterclaims, Apr. 18, 1975.

3,400,245, C. D. Burgess, SADIRON; **3,415,703,** same, PROCESS FOR FACE-SEAMING CARPETING, **filed** Dec. 16, 1968, D.C. Del. (Wilmington), Doc. 3644, *Montgomery Mills Inc. and Consolidated Foods* v. *Giffen-Burgess Corp.* It is hereby stipulated that all of the above action and claims are dismissed with prejudice against the plaintiffs as to the complaint and with prejudice against the defendant as to the counterclaims, Apr. 18, 1975.

3,415,703. (See 3,400,245.)

3,429,022, E. A. Oster, SCRAP RECOVERY PROCESS, **filed** May 9, 1972, D.C., E.D. Mich. (Detroit), Doc. 38273, *Earl A. Oster* v. *Grant-Southern Iron & Metal Company.* Complaints are hereby dismissed with prejudice without adjudicating any issues, Apr. 17, 1975. **Same, filed** May 9, 1972, D.C., E.D. Mich. (Detroit), Doc. 38274, *Earl A. Oster* v. *Sam Allen & Son, Inc.* Complaints are hereby dismissed with prejudice without adjudicating any issues, Apr. 17, 1975.

3,444,214, P. Buecheler, 1-AMINO-4-ANILINO-2-NITRO-ANTHRAQUINONES AND DERIVATIVES, **filed** Dec. 17, 1974, U.S. Court of Claims (District of Columbia), Doc. 343–72, *Weather Engineering Corporation of America and Weather Engineering Corporation of Canada, Ltd.* v. *The United States and The University of Wyoming.* Order that the motion for summary judgment by the third-party defendant, University of Wyoming, be granted and the said third-party is dismissed as a party to this case, Mar. 21, 1975.

3,485,234, R. C. Stevens, TUBULAR PRODUCTS AND METHOD OF MAKING SAME, **filed** Dec. 9, 1971, D.C., S.D. Ind. (Indianapolis), Doc. IP71–C–692, *Cordis Corporation* v. *Cook Incorporated.* Pursuant to Rule 41(a)(ii) and (c) of FRCP, the above cause is dismissed with prejudice as to plaintiff's claims in complaint and with prejudice as to defendant's claims in counterclaims, Apr. 17, 1975.

3,506,385, Weber and Cressman, PHOTOFLASH LAMP; **3,598,984,** S. L. Slomski, PHOTOFLASH LAMP ARRAY; **3,598,985,** Harnden and Kornrumpf, CONSTRUCTION OF DISPOSABLE PHOTOFLASH LAMP ARRAY; **3,609,332,** D. R. Schindler, PHOTOFLASH LAMP ARRAY WITH REFLECTOR-LAMP MODULE; **3,725,693,** Anderson, Hanson, Lecrone and Landgraf, LINEAR PHOTOFLASH LAMP ARRAY AND REFLECTOR UNIT THEREFOR, **filed** Apr. 4, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1083, *General Electric Company* v. *GTE Sylvania Inc.*

3,512,594, Grusin and Logan, BATHROOM SCALE, **filed** Apr. 29, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1365, *Gerald M. Grusin et al.* v. *Terraillon et al.*

3,516,692, D. E. Albrecht, BRANCH PIPE CONNECTION, **filed** Apr. 3, 1975, D.C., N.D. Tex. (Dallas), Doc. CA3–75–0400–C, *Allied Piping Products Company, Inc.* v. *Interstate Fittings, Inc.*

3,598,984. (See 3,506,385.)

3,598,985. (See 3,506,385.)

3,609,332. (See 3,506,385.)

3,610,512, H. J. Hermalin, HAND-HELD FOOD HOLDER, **filed** Apr. 17, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV–75–1329, *Harry J. Hermalin et al.* v. *Franchise Realty Interstate Corp. et al.*

3,617,086, King and Burton, FOLDABLE AND TRANSPORTABLE HOME; **3,738,678,** same, FLOOR FRAME STRUCTURE; **D. 225,216,** same, MODULAR HOME, **filed** Apr. 15, 1975, D.C., N.D. Ind. (South Bend), Doc. C–75–79, *Burkin Homes Corporation* v. *Chalet Homes, Inc. and Fred Tenorio.*

3,678,151, Horonick and Munschy, BIOLOGICAL STAINING METHOD, **filed** Dec. 20, 1974, D.C.N.J. (Newark), Doc. 74–1992, *Gugol Science Corp.* v. *Lemmon Pharmacal Company.* Stipulation and order of dismissal of action, Apr. 22, 1975.

3,685,128, Sharp and Hull, MACHINE AND METHOD FOR REMOVING ENGINES FROM VEHICLES, **filed** Apr. 10, 1975, D.C., N.D. Tex. (Dallas), Doc. CA3–75–0438–C, *Al-Jon Incorporated* v. *Mobile Auto Crushers Corporation of America.*

3,700,792, Harrison III, Honey and Tajchman, COMPUTER ANIMATION GENERATING SYSTEM, **filed** Aug. 20, 1974, D.C., S.D.N.Y., Doc. 74–C–3603, *Computer Image Corp.* v. *Rutt Instruments Corp. and Rutt/Etra Video Systems, Inc.* Stipulation and order of dismissal dismissing complaint as to defendant and defendant's counterclaims without prejudice, Mar. 25, 1975.

3,725,693. (See 3,506,385.)

3,732,633, Margolis and Saunders, SLIDING PANEL DISPLAY, **filed** Sept. 17, 1974, D.C.N.J. (Trenton), Doc. 74–1453, *Ply-Gem Industries, Inc.* v. *Hunterdon Home Center Inc. and Robert Fischer.* Consent judgment for permanent injunction, etc. without costs, Apr. 22, 1975.

3,733,230, A. R. Prittle, LABEL INSPECTION SLITTER/REWINDER, **filed** Apr. 25, 1975, D.C. E.D. Mo. (St. Louis), Doc. 75–391C(4), *Arpeco Engineering Limited* v. *Allied Gear and Machine Company.*

3,738,678. (See 3,617,086.)

3,835,292, Walter, Kronheim and Levine, STEAM CURLING IRON, **filed** Apr. 11, 1975, D.C., S.D.N.Y., Doc. 75–C–1773, *Clairol Incorporated* v. *North American Phillips Corporation.*

3,841,932, Forler and Heins, METHOD AND APPARATUS FOR REPAIRING CRACKS IN WINDSHIELDS, **filed** Feb. 21, 1975, D.C., N.D. Tex. (Dallas), Doc. CA3–75–208–D, *Bevan Enterprises, Inc.* v. *The Glass Doctor, Inc., J. F. Harmon and Robert J. Owens.*

D. 225,216. (See 3,617,086.)

ERRATA

In the notices of Defensive Publications appearing on pages 9–12 in the Official Gazette of June 3, 1975, the names of the assignees were omitted and should be added as indicated below:

T935,001. E. I. du Pont de Nemours and Company, Wilmington, Del.
T935,002. Pacific Lighting Service Co., Los Angeles, Calif.
T935,003. International Business Machines Corporation, Armonk, N.Y.
T935,004. International Business Machines Corporation, Armonk, N.Y.
T935,005. International Business Machines Corporation, Armonk, N.Y.
T935,006. E. I. du Pont de Nemours and Company, Wilmington, Del.

In the notices of Defensive Publications appearing on pages 7 and 8 in the Official Gazette of July 1, 1975, the following names of assignees were omitted and should be added:

T936,001. E. I. du Pont de Nemours and Company, Wilmington, Del.
T936,002. E. I. du Pont de Nemours and Company, Wilmington, Del.
T936,005. Du Pont of Canada Limited, Quebec, Canada

Certificates of Correction for the Week of Aug. 19, 1975

P.P. 3,727	3,856,935	3,874,494	3,881,863
D. 234,478	3,857,807	3,874,541	3,882,083
D. 234,652	3,858,520	3,875,195	3,882,459
D. 234,771	3,858,670	3,875,770	3,882,738
3,530,192	3,858,756	3,875,856	3,882,831
3,634,428	3,859,023	3,875,884	3,883,002
3,701,554	3,860,319	3,876,422	3,883,546
3,751,138	3,862,239	3,876,980	3,883,596
3,788,206	3,862,799	3,877,103	3,883,657
3,806,906	3,864,177	3,877,129	3,883,672
3,808,898	3,864,745	3,877,133	3,884,349
2,815,148	3,864,875	3,877,155	3,884,359
3,817,239	3,865,098	3,877,915	3,884,453
3,824,969	3,865,162	3,877,939	3,884,905
3,831,927	3,865,704	3,877,953	3,885,052
3,832,425	3,865,784	3,878,270	3,885,168
3,833,512	3,866,638	3,879,334	3,885,407
3,841,597	3,867,120	3,879,362	3,885,742
3,843,552	3,867,574	3,879,363	3,885,808
3,845,528	3,868,258	3,879,525	3,886,403
3,846,152	3,868,332	3,879,625	3,886,495
3,847,911	3,869,001	3,879,717	3,886,998
3,847,921	3,870,212	3,880,134	3,887,643
3,848,039	3,870,733	3,880,156	3,887,763
3,850,841	3,871,184	3,880,236	3,887,800
3,852,140	3,871,904	3,880,753	3,887,992
3,852,237	3,872,364	3,880,781	3,888,444
3,852,488	3,872,400	3,880,889	3,888,551
3,853,943	3,872,830	3,881,143	3,888,989
3,855,197	3,873,335	3,881,474	3,889,027
3,855,235	3,873,354	3,881,505	3,889,033
3,855,335	3,873,404	3,881,641	
3,856,914	3,874,377	3,881,835	

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 19, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry: Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-23-74
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-18-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	12-17-74
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products: Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions: Bleaching; Dyeing and Photography.	10-23-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	11-7-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures: Illumination: Horology; Acoustics; Recorders; Weighing Scales.	12-4-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	7-3-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-15-74
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-26-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-2-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-13-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-2-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools: Cutlery; Jacks.	1-2-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.: Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-2-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	11-6-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-8-75

Expiration of patents: The patents within the range of numbers indicated below expire during August 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,845,625 to 2,849,713 inclusive

Plant Patents..... Numbers 1,740 to 1,745 inclusive

REISSUES

AUGUST 19, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 28,518

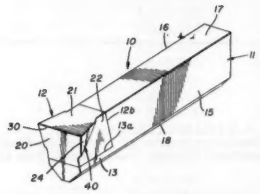
CUTOFF TOOL HAVING IMPROVED CUTTING TIP

William B. Stein, Barberton, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Original No. 3,660,877, dated May 9, 1972, Ser. No. 30,682, Apr. 22, 1970. Application for reissue Dec. 5, 1974, Ser. No. 529,612

Int. Cl.[2] B26D *1/00*

U.S. Cl. 29—95 R **8 Claims**



1. An improved cutting tip for use on cutting tools, comprising;

A. at least one hardened tip adapted to be supported on said cutting tool and having an integral enlarged transverse cutting portion extending transversely across said cutting tool; and

B. said cutting portion being

1. integral with said hardened body and

2. having opposed side surfaces that are respectively disposed at equal compound angles with respect to the remaining opposed side surfaces of said hardened body portion and

3. projecting transversely beyond said remaining opposed side surfaces

a. whereby said compound surfaces provide side and back clearance areas for said cutting edge in a localized area of said hardened body [.];

C. the plane of said side surfaces having compound angles being transversely offset with respect to the plane of said remaining side surfaces.

Re. 28,519

CIRCULAR KNITTING MACHINE WITH PATTERN WHEELS

Lester Mishcon, New York, N.Y., assignor to The Singer Company, New York, N.Y.

Original No. 3,513,666, dated May 26, 1970, Ser. No. 670,097, Sept. 25, 1967. Continuation of Ser. No. 99,465, Dec. 18, 1970, abandoned. Application for reissue July 19, 1973, Ser. No. 380,633

Int. Cl.[2] D04B *15/76*

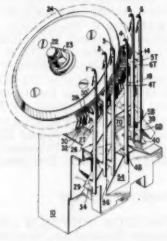
U.S. Cl. 66—50 A **11 Claims**

9. A circular knitting machine of the type having a cylinder provided with peripheral slots for accommodating latch type knitting instrumentalities, and at least three relatively rotatable serially adjacent cam sections cooperative with said cylinder, said adjacent cam sections being provided with respective pattern wheels, each of said pattern wheels being of the type having its plane of rotation at an angle with respect to the direction of relative cylinder travel and being provided with skewed jack accommodating slots for use in raising certain of said instrumentalities of said cylinder to various predetermined heights, said machines being characterized in that:

a. the total space requirements of said three serially adjacent cam sections peripherally of the cylinder is not substantially greater than that occupied by the needle butt contacting surfaces of the raise cams, the pattern wheels and the stitch cams which act to change the elevation of the needles of said three adjacent cam sections.

b. at least each of some of said knitting instrumentalities are provided with first and second butts,

c. said adjacent cam sections with pattern wheels are further provided with a low raise cam adapted to raise the first butts of knitting instrumentalities to a pattern wheel introduction elevation in which the second butts thereof are positioned for accommodation into mesh with the pattern wheel slots, a stitch cam to lower knitting instrumentalities to a stitch making position, a placer cam between the raise and stitch cam underlying an effective portion of the pattern wheel of the cam section, a wing cam to lower knitting instrumentalities other than the knitting instrumentalities raised by the pattern wheel from said pattern wheel introduction elevation to a welt position, and a guard cam disposed to restrict the upward movement of knitting instrumentalities from the raise cam and placer cam, the pattern wheels of said



adjacent cam sections being closely nested with a non-working portion of the pattern wheel of one cam section overlying the plane of a working portion of the stitch cam of the adjacent cam section encountered by the knitting instrumentalities before entering said one cam section.

d. each of the raise, placer and stitch cams being disposed for cooperation only with said first butt of each of those knitting instrumentalities with first and second butts, and each of said pattern wheels being disposed for cooperation only with said second butt of each of said knitting instrumentalities with first and second butts, said raise cam being effective to raise said knitting instrumentalities less than one third of the maximum total stroke capable of being imparted to said needles by the combined effect of the raise cam and the pattern wheel, the raise and stitch cams in each cam section being spaced apart a distance not substantially greater than that required to have interposed between working portions thereof the working edge portion of the overlying pattern wheel.

Re. 28,520

SAFETY VALVE ASSEMBLY FOR CONTROLLING CLUTCH AND BRAKE IN POWER PRESS OR THE LIKE

Kenneth R. Mahorney, deceased, by Ardith Mahorney, legal representative, Bartlett, Ill., assignors to Ross Operating Valve Company, Detroit, Mich.

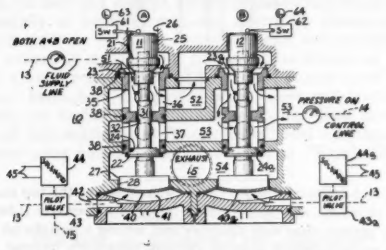
Original No. 3,670,767, dated June 20, 1972, Ser. No. 122,008, Mar. 8, 1971. Application for reissue Sept. 14, 1973, Ser. No. 397,306

Int. Cl. F16k *11/10*

U.S. Cl. 137—596 **14 Claims**

1. A safety valve assembly for supplying pressurized fluid from a supply line to a clutch and brake control line to ener-

gize the clutch and de-energize the brake and for alternatively exhausting fluid from the control line to an exhaust line to de-energize the clutch and energize the brake which comprises means defining a fluid supply line chamber and an intermediate chamber as well as a control line chamber and an exhaust line chamber, a first valve having a movable valve member cooperating with first and second seats, the first seat being normally closed and the second seat being normally open and having an actuator for activating such valve member, a second valve having a movable valve member cooperating with third and fourth seats, the third seat being normally closed and the fourth seat being normally open and having an actuator for activating such valve member, the first seat being interposed between the supply line chamber and the intermediate chamber and the third seat being interposed between the intermedi-



ate chamber and the control line chamber so that such seats are effectively in series with one another with pressurized fluid being passed successively through the first and third seats from the supply line chamber to the control line chamber when the valve members are simultaneously activated by the actuators, the second and fourth seats being both interposed between the control line chamber and the exhaust line chamber with such seats being effectively in parallel with one another so that in the event either one of the movable valve members, upon deactuation, sticks in its activated position (a) flow of pressurized fluid from the supply line will be cut off and (b) [direct access] *a direct path* for exhausted fluid will be provided from the control line to the exhaust line *which bypasses said first and third seats* for insuring that the clutch and brake are in a safe condition.

Re. 28,521

CONTAINER CONSTRUCTION

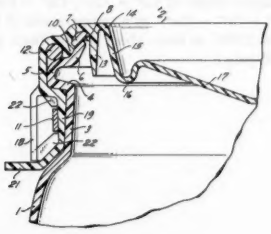
Wilhelm Hammes, Much, Germany, assignor to Mauser Kommanditgesellschaft, Cologne, Germany

Original No. 3,664,544, dated May 23, 1972, Ser. No. 116,797, Feb. 19, 1971. Application for reissue Feb. 25, 1974, Ser. No. 445,486

Claims priority, application Germany, Feb. 21, 1970, 2008111

Int. Cl. B65d *41/16, 45/32*

U.S. Cl. 220—306 **30 Claims**



1. A container, comprising a barrel of synthetic plastic material including a substantially cylindrical main body portion having a longitudinal axis, and a head portion at one axial end and of one piece with said main body portion, said head portion comprising a circumferential wall including a first annular section substantially parallel with said axis, a second annular section inclined inwardly towards said axis at a greater angle and a third annular section projecting axially from said second section and inclined inwardly towards said axis at a lesser angle, said third section having an outer free edge provided with a radially outwardly projecting circumferential bead and an inner free edge bounding an opening communicating with the interior of said barrel; a cover of synthetic plastic material overlying said head portion and comprising a one-piece annular rim including an outer annular rim portion exteriorly surrounding said head portion and having a circumferential rib abutting said second and third sections and engaging beneath said bead, an inner annular rim portion projecting into said opening proximal to said inner free edge, and a transverse portion of one piece with said inner annular rim portion and spanning said opening; a sealing element sealingly confined intermediate and in abutment with said second annular section, said outer rim portion and said rib; and at least one strap element encircling said outer rim portion and tightly urging the same into contact with said first annular section.

Re. 28,522

APPARATUS FOR A RIGID ROAD WHICH HAS A TEXTURED SURFACE

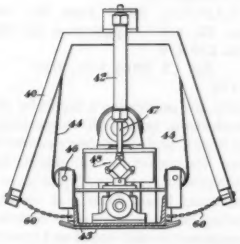
David Payne Maynard, Slough, and John Weaver, Beaconsfield, both of England, assignors to The Cement and Concrete Association Terminal House, London, England

Original No. 3,683,762, dated Aug. 15, 1972, Ser. No. 63,867, Aug. 14, 1970. Application for reissue Apr. 12, 1974, Ser. No. 460,476

Claims priority, application United Kingdom, Aug. 15, 1969, 40, 840/69

Int. Cl. E01c *23/16*

U.S. Cl. 404—93 **14 Claims**



1. Apparatus for making a textured-surface rigid road of concrete or the like, comprising a gantry adapted to span at least a portion of a newly laid plastic concrete road, means supporting said gantry on a subgrade, a frame movably supported on said gantry, a profile beam having a groove-forming working surface suspended by tension springs from said frame, said groove-forming surface having rib means extending in the direction of movement of said frame and suspended profile beam, piston means between said frame and said profile beam for raising and lowering said beam relative to the frame, a flexible connection between said piston means and said profile beam, and vibrator means directly connected to said profile beam, whereby upon actuation of said vibrator means the profile beam fluidizes the underlying concrete and molds at least one groove therein while being floatingly supported by said tension springs.

Re. 28,523

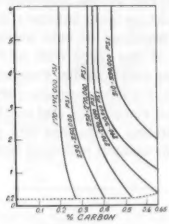
HIGH STRENGTH ALLOY STEEL COMPOSITIONS AND PROCESS OF PRODUCING HIGH STRENGTH STEEL INCLUDING HOT-COLD WORKING

Morse Hill, Berea, and Stephen J. Matas, Independence, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Original No. 3,366,471, dated Jan. 30, 1968, Ser. No. 323,026, Nov. 12, 1963. Continuation-in-part of Ser. No. 169,076, Jan. 26, 1962, abandoned. Application for reissue Aug. 28, 1968, Ser. No. 771,681

Int. Cl.[2] C22C *38/08, 38/52*

U.S. Cl. 75—123 K **19 Claims**



1. An alloy steel consisting essentially of about: 3 to 12% of metal of the group *consisting of* nickel and copper, copper when present not exceeding one-half the nickel content, 0.2 to 7% cobalt, up to 2% each of manganese, chromium and aluminum, up to 1.5% silicon, up to 3.5% molybdenum, up to 0.5% vanadium, up to 0.4% columbium, up to 0.25% tantalum, up to 0.75% tungsten, up to 0.1% boron, [up] *0.1* to 0.3% carbon, and the balance substantially all iron.

Re. 28,524

APPARATUS FOR TREATING A LIQUID WITH A GAS, NOTABLY FOR DEODORIZING EDIBLE OIL

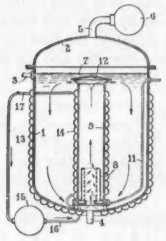
Robert Brebant, Sainte-Mande, France, assignor to Chemetron Corporation, Chicago, Ill.

Original No. 3,517,732, dated June 30, 1970, Ser. No. 692,921, Dec. 22, 1967. Application for reissue June 8, 1972, Ser. No. 150,856

Int. Cl. B01d *3/00, 3/10*

U.S. Cl. 202—175 **9 Claims**

1. An apparatus for processing a liquid by means of a gas, notably for deodorizing edible oil, comprising a vessel for containing said liquid, *said vessel being connected to a source of vacuum*, pipe line means for introducing liquid into said vessel to fill said vessel to a selected liquid level and means for discharging processed liquid from said vessel, at least one vertically extending chimney open at its bottom and top ends and *centrally* positioned in said vessel and extending upwardly from near the bottom of said vessel to above said liquid level, said chimney having a cross sectional area which is a minor part of the cross sectional area of said vessel, *said chimney comprising a hollow wall, said hollow wall formed by a plurality of coaxial turns of coiled tubing, said tubing having a circular cross section and said turns in abutting relation to one another, means connected to said tubing at the bottom of said chimney for supplying to and circulating in said hollow wall to said top of said chimney a fluid at a temperature other than that of said liquid whereby said hollow wall constitutes heat transfer means*, at least one steam injector immersed in said liquid and discharging in said chimney to produce upward flow of liquid in said chimney, said liquid being drawn into the bottom end of said chimney and discharged from the top end of said chimney, and deflecting baffle means spaced above the top end of said chimney, said baffle means being of a diameter substantially greater than said chimney and having a peripheral surface portion which extends radially outwardly beyond said chimney and is directed outwardly and downwardly to direct outwardly and downwardly liquid discharged from the top end of said chimney.



Re. 28,525

PROCESS FOR HYDROLYZING NITRILES

Janice L. Greene, Warrensville Heights, and Murrel Godfrey, Cleveland, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Original No. 3,381,034, dated Apr. 30, 1968, Ser. No. 468,546, June 30, 1965. Application for reissue Apr. 26, 1974, Ser. No. 464,650

Int. Cl. C07c *103/08*

U.S. Cl. 260—557 R **12 Claims**

2. The process for hydrolyzing a nitrile selected from the group consisting of acetonitrile, propionitrile, butyronitrile, acrylonitrile, methacrylonitrile, crotononitrile, maleic dinitrile, glutaronitrile, succinonitrile, adiponitrile, and cyclobutane-1,2-dicyanide [and benzonitrile] comprising contacting said nitrile with water at a pH of from about 1 to about 12.5 in the presence of a copper ion, said copper ion being at least partially soluble in water, the nitrile or in both water and nitrile and said copper ion being composed of copper in a combined valence state of $Cu^{\circ} + Cu^{+}$, $Cu^{\circ} + Cu^{++}$, $Cu^{+} + Cu^{++}$, or $Cu^{\circ} + Cu^{+} + Cu^{++}$ at a temperature of from about 25°C to about 220°C at from about atmospheric pressure up to about 2000 psig.

PLANT PATENTS

AUGUST 19, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,765
KALANCHOE PLANT
Lawrence T. Irwin, Amarillo, Tex., assignor to J and L Plants, Incorporated, Canyon, Tex.
Filed May 13, 1974, Ser. No. 469,699
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of kalanchoe plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of an extremely dwarf habit of growth as compared with the normal growth habit of its parent "Exotic Gold" and other kalanchoe varieties; a much more self-branching habit; an earlier blooming habit ranging from about 7 to 10 days earlier than "Exotic Gold"; and a foliage and flower color basically similar to those of "Exotic Gold."

3,766
POINSETTIA PLANT
Paul Ecke, Jr., Encinitas, Calif., assignor to Paul Ecke Ranch, Encinitas, Calif.
Filed July 15, 1974, Ser. No. 488,328
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct variety of poinsettia plant substantially as herein shown and described, characterized by its ability to grow at 3 to 4 degrees lower night time temperature than prior varieties to produce large luxury-type plants for the commercial trade.

3,767
CARNATION PLANT
Takeshi Yoichi Yonemoto, 1328 Henderson Ave., Santa Clara, Calif. 95051
Filed Aug. 12, 1974, Ser. No. 497,127
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—70

1. A new and distinct variety of carnation plant, substantially as herein shown and described, characterized by the deep purple color and narrow white edging of the outer petals of its flowers, by the miniature size of the flowers, and by its profusely blooming perennial growth habit.

3,768
CARNATION PLANT
Takeshi Yoichi Yonemoto, 1328 Henderson Ave., Santa Clara, Calif. 95051
Filed Aug. 12, 1974, Ser. No. 497,128
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—70 **1 Claim**

1. The new and distinct variety of carnation plant, substantially as herein shown and described, characterized by its large orange-red blossoms and its profuse and continuous production as a greenhouse plant.

PATENTS

GRANTED AUGUST 19, 1975

ERRATA

For CLASS	See PATENT NO.
228-107	3,899,825
351-113	3,899,840
197-127	3,900,098
197-159	3,900,099
285-004	3,900,223
250-199	3,900,404
250-468	3,900,405
427-038	3,900,636
427-034	3,900,639
427-055	3,900,646
427-248	3,900,660
427-386	3,900,682
357-007	3,900,771
273-102	3,900,778
325-396	3,900,798
335-052	3,900,820
329-122	3,900,821
330-149	3,900,823
346-001	3,900,866
343-006.5 LC	3,900,867
343-073	3,900,868
343-077	3,990,869
343-007 A	3,990,870
343-008	3,990,871
343-009	3,990,872
343-012 R	3,900,873
343-016	3,900,874
343-007	3,900,875
343-105 R	3,900,876
343-108	3,900,877
343-112	3,900,878
343-113	3,900,879
343-228	3,900,880

PATENTS

GRANTED AUGUST 19, 1975

GENERAL AND MECHANICAL

3,899,796

METACARPOPHALANGEAL JOINT

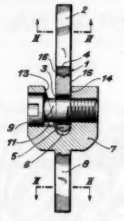
Andre Bahler; Norbert Gschwend, and Heinrich Scheier, all of Zurich, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed June 27, 1974, Ser. No. 483,528

Claims priority, application Switzerland, July 19, 1973, 10544/73

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.91 **8 Claims**



1. A hinging metacarpophalangeal joint comprising

a first joint part having a pair of opposed side walls defining a slot-like aperture therein and an intramedullary stem extending therefrom;

a pivot pin secured in said first joint part across said aperture from one side wall to the other side wall;

a second joint part pivotally mounted on said pivot pin for pivoting in a plane transverse to said pivot pin through an approximately right angle, said second joint part having an intramedullary stem extending therefrom and a pair of opposite sides each facing a respective one of said side walls of said first joint part, said sides and said side walls being shaped to permit pivoting of said second joint part towards only one of said side walls in a first direction transverse to said plane with said stem of said second joint part extended in a direction axial of said stem of said first joint part.

3,899,797

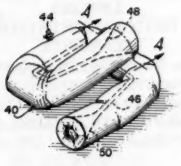
INFLATABLE STRUCTURAL COMPONENT

Dennis Gunst, Los Angeles, Calif., assignor to Morris Schwartzman, Los Angeles, Calif., a part interest

Continuation-in-part of Ser. No. 349,404, April 9, 1973, abandoned. This application July 15, 1974, Ser. No. 488,471

Int. Cl.² A47C *27/08*

U.S. Cl. 5—350 **12 Claims**



1. An inflatable structural component comprising:

a. a tubular envelope; and

b. a flexible tensile member within said envelope, two spaced points along said tensile member being secured to the ends of said envelope, the length of said tensile member between said spaced points being shorter than the distance along said envelope between said ends, whereby the longitudinal axis of said tubular envelope may be made to assume and maintain a bent configuration.

3,899,798

METHOD FOR MANUFACTURING INSOLE FOR A SHOE

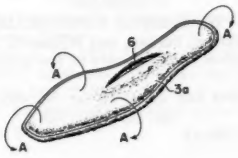
Sueo Kihara, Osaka, Japan, assignor to Kureha Kagaku Kogyo K.K. and Kihara Sangyo Kabushiki Kaisha, both of Tokyo, Japan

Filed May 24, 1974, Ser. No. 473,199

Claims priority, application Japan, June 8, 1973, 48-65240

Int. Cl. A43d

U.S. Cl. 12—146 B **5 Claims**



1. Method for manufacturing insole for a shoe comprising in sequential combination: formation of a material sheet from a base layer and one or more sets of surface layers of extensible nature by superimposing said layers on each other; formation of material insole by application of thermal fusion cutting to said material sheet, said material insole being patterned after a given standard foot style; formation of a slit in the uppermost surface layer of said material insole; overturning of said uppermost surface layer utilizing said slit formed in said uppermost surface layer; closing of said slit by application of thermal fusion embossing; and formation of a decorative pattern on said uppermost surface layer of said material insole by application of thermal fusion embossing.

3,899,799

PIT MOUNTED BRUSH ASSEMBLY

Daniel C. Hanna, 1133 S.W. Rivington Dr., Portland, Oreg. 97201

Filed Jan. 2, 1974, Ser. No. 429,931

Int. Cl.² B60S *3/06*

U.S. Cl. 15—21 D **10 Claims**

1. In a brushing device,

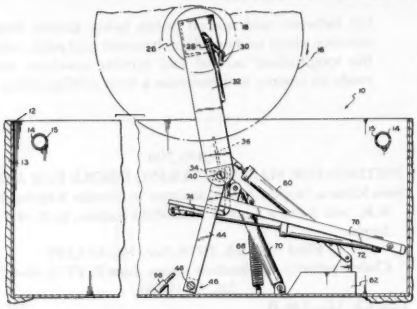
a brush,

carrier means normally holding the brush in a path of a car to be washed and permitting the brush to be moved by the car to an edge of the path,

and control means actuated by the car when the car reaches a predetermined position for moving the carrier means to cause the brush to move forwardly with the car to prolong contact of the brush and the car,

means for moving the carrier means to move the brush out

of contact with the car after the front end portion of the car has passed the brush and for moving the carrier means



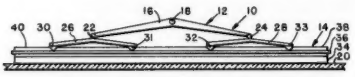
to move the brush back into contact with the car as the rear end portion comes abreast of the brush.

3,899,800

WINDSHIELD WIPER BLADE

Robert O. Wittwer, Portage, and William H. Harbison, Merrillville, both of Ind., assignors to The Anderson Company, Gary, Ind.

Filed Aug. 22, 1974, Ser. No. 499,971
Int. Cl. B60s *1/02*
U.S. Cl. 15—250.42 **8 Claims**



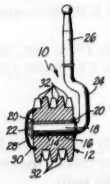
2. A wiper blade having a resilient wiping element, a flexible backing strip nested in said wiping element, and a superstructure operatively connected to said backing strip and to a wiper arm, said superstructure having at least two articulated members for dividing pressure received from the wiper arm into four equally spaced apart pressure points on said backing strip, the two remote pressure points engage said backing strip one-eighth the length of said wiping element in from each end of said backing strip.

3,899,801

CASTOR FOR USE WITH PILE CARPET

Vernon J. Carrier, 25830 Viana St., Lomita, Calif. 90717

Filed Aug. 19, 1974, Ser. No. 498,380
Int. Cl.² A47B *91/00*
U.S. Cl. 16—45 **6 Claims**



1. A castor for use on a pile carpet, said castor having a cylindrical wheel and means for mounting said wheel so that said wheel can rotate about its axis in which the improvement comprises:

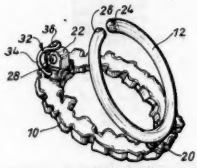
a plurality of separate bosses located on the surface of said wheel so as to extend therefrom, said bosses being spaced from one another and being located adjacent to one another, said bosses being the only projections from the surface of said wheel capable of contacting a carpet, said bosses being shaped so as to have ends remote from said wheel of a non-pointed configuration and being shaped so that said ends are of smaller dimensions than the portions of said bosses at the periphery of said wheel.

3,899,802

FASTENER MEANS FOR AN ARTICLE OF JEWELRY

Joachim Koehle, Pforzheim, Germany, assignor to J. Koehle KG, Pforzheim, Germany

Filed Feb. 5, 1974, Ser. No. 439,697
Claims priority, application Germany, Feb. 27, 1973, 2309681
Int. Cl.² A44B *13/00, 21/00*
U.S. Cl. 24—73 HR **9 Claims**



1. An article of jewelry, comprising

a. a first member (**10**) having a rear surface and a decorative front surface;

b. a resilient generally C-shaped split ring member (**12**) having a pair of arm portions between the extremities (**24, 26**) of which is defined an opening;

c. hinge means (**20**) pivotally connecting the split ring member to the rear surface of said first member for pivotal movement between parallel closed and angularly arranged open positions relative to said first member,

1 said hinge means being arranged between said first and split ring members to cause the same to be spaced when said members are in the parallel closed position,

2 said hinge means being diametrically opposed to the opening contained in said split ring member; and

d. a bridge member (**22**) secured to and extending axially rearwardly from the rear surface of said first member opposite said split ring opening, said bridge member having a width dimension slightly greater than the spacing distance between the ends of said split ring member, whereby when said bridge member is inserted into the opening in the split ring member, the split ring member is locked in the closed position by the resilient force of the split ring arm portions.

3,899,803

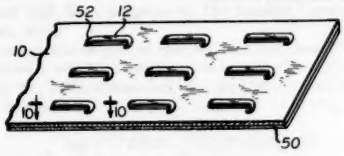
SELF-GRIPPING DEVICE WITH PREFORMED GRIPPING ELEMENTS

George C. Brumlik, Montclair, N.J., assignor to Ingrip Fasteners, Inc., New York, N.Y.

Continuation of Ser. No. 179,880, Sept. 13, 1971, abandoned. This application Dec. 10, 1973, Ser. No. 423,611
Int. Cl.² A44B *17/00*
U.S. Cl. 24—204 **8 Claims**

1. Self gripping device comprising a sheet member containing a multiplicity of gripping elements distributed in all directions over said sheet member, said gripping elements having distinct gripping means integrally formed therein within a frame said gripping means being oriented transverse to the longitudinal axis of said sheet member, said gripping elements and the distinct gripping means being bent parallel and generally in a common plane and out of plane to the sheet, said gripping elements being adapted to be positioned in a gener-

ally upright position from one side of said sheet for self gripping engagement with a receiving layer, the opposite side of



said sheet having an adhesive layer applied thereto without coating the parallel out of plane gripping elements.

3,899,804

SLIDER

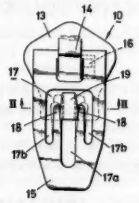
Teruaki Kawashima, Namerikawa, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1973, Ser. No. 393,640

Claims priority, application Japan, Sept. 5, 1972, 47-103540

Int. Cl. A44b *19/26*

U.S. Cl. 24—205.15 R **3 Claims**



1. A slider for a slide fastener, which comprises a top wing; a bottom wing; a post integral with said top and bottom wings and connecting them together at one end which constitutes the front end of the slider; a front lug disposed at said front end of the slider and projecting away from said top wing; a rear lug disposed at the end of the slider opposite said front end and projecting away from said top wing; a generally planer pull tab pivotally connected to said front lug and having catch means engagable with said rear lug, said catch means including means defining an opening in the pull tab and a pair of parallel spaced-apart elastically flexible tongues integrally formed with and lying in the plane of the pull tab and projecting into said opening, said rear lug having a tapered portion, a central barrel portion and a reduced neck portion having surfaces disposed for resilient snap-action engagement with said tongues to releasably secure the pull tab in lock position against the top wing.

3,899,805

INDENTED SHEET

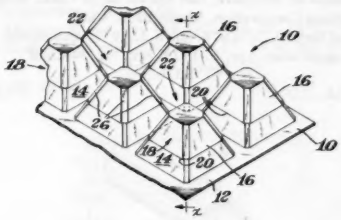
William J. McMillan, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 13, 1973, Ser. No. 379,147

Int. Cl. B32b *3/30*

U.S. Cl. 24—213 B **7 Claims**

1. An indented sheet describing at a surface portion thereof, repeating, regularly distributed, hollow projections, a like distribution of repeating pocket areas, at least certain of such projections including enlarged head portions, respectively, restricted neck regions defined in said pocket areas through means of said enlarged heat portions, said enlarged heat portions comprising cap elements affixed to said projections, such indented sheet being comprised of sufficiently resilient material for deformable, resilient passage of such enlarged heat portions by a like-sized restricted neck region for purpose of



interlocking such surface portion to a like surface or the equivalent thereof.

3,899,806

SAFETY HOOK

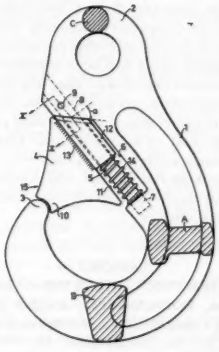
Bengt Frans Allan Berg, Gemla, Sweden, assignor to K A Bergs Smide AB, Gemla, Sweden

Filed Sept. 27, 1973, Ser. No. 401,359

Claims priority, application Sweden, Oct. 25, 1972, 13761/72; Mar. 13, 1973, 7334/73

Int. Cl.[2] B64D *17/38*; **A44B** *13/00*

U.S. Cl. 24—241 PL **15 Claims**

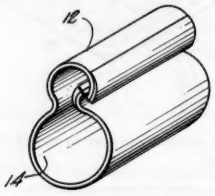


1. A hook having a normal vertical axis when freely suspended, said hook comprising a suspension end portion, a hook tip, and an arcuate hook shank which connects said suspension end portion with said hook tip and defines a median plane through said suspension end portion and said hook tip; said suspension end portion, said hook tip and a portion of said shank defining a throat through which attachment means can be introduced and brought into engagement with said hook; at least one safety latch means pivotally mounted for movement about an axis which forms a substantial angle with said normal vertical axis of said hook, said pivotal axis being located substantially in said median plane, said safety latch member being pivotally movable between a first stable position in which it blocks said throat and a second position out of blocking relation with said throat; and resilient means for urging said safety latch member to its first stable position.

3,899,807
HEAT RECOVERABLE ARTICLES AND METHOD OF MAKING SAME

Richard C. Sovish, Los Altos; Michael B. Sullivan, Cupertino, and Judson D. Wetmore, San Mateo, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 130,678, April 2, 1971, abandoned. This application Apr. 5, 1973, Ser. No. 348,348
Int. Cl. B32b *3/02*
U.S. Cl. 24—255 C 4 Claims



1. A laminar article having two primary faces and comprising first, second and third thermoplastic laminae which have been crosslinked chemically or by irradiation, said second and third laminae being laminated respectively to opposite edge portions of the opposite faces of said first lamina, said first lamina having been rendered heat recoverable by expansion in its crosslinked state whereas relative to said first lamina said second and third laminae lack heat recoverability, said article being heat recoverable to a configuration describing an elongate S in cross section.

4. A method of forming a heat recoverable wrap-around closure having first, second and third laminae of thermoplastic material which has been crosslinked chemically or by irradiation, which method comprises laminating second and third laminae respectively to opposite edge portions of the opposite faces of a first lamina which has been rendered heat recoverable by expansion in its crosslinked state and before or following the step of lamination, crosslinking the second and third laminae, said second and third laminae being non-heat recoverable relative to said first lamina such that the resulting closure is heat recoverable to an elongate S in cross-section and, upon interlocking the arcuate end-portions of said S is further heat recoverable in interspiraling fashion to form a separation resistant closure.

3,899,808
APPARATUS FOR UNCURLING SELVEDGE

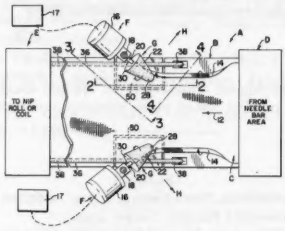
Richard A. Ryan, Eddington, Pa., assignor to Butterworth Manufacturing Company, Inc., Bethayres, Pa.

Continuation of Ser. No. 206,647, Dec. 10, 1971, abandoned. This application Jan. 22, 1974, Ser. No. 435,431
Int. Cl. D06c *3/06*
U.S. Cl. 26—54 12 Claims

1. Apparatus for removing curls from opposite longitudinal curled selvedges of a fabric comprising: support means for supporting elongated fabric moving as a continuous strip in a longitudinal direction and having curled selvedges and longitudinal edges along said selvedges;

a pair of uncurling members, said uncurling members being positioned above said support means adjacent said selvedges, said uncurling members having substantially conical outer surface portions, said substantially conical outer surface portions having free small diameter ends and driven large diameter ends, each of said conical outer surface portions making line contact with one of said selvedges along lines intersecting said longitudinal selvedges at included acute angles, but with substantially no contact with the fabric between selvedges;

independent drive means for rotating said uncurling members in a direction for applying uncurling forces to said selvedges in directions rearwardly of said longitudinal direction of movement of said fabric without appreciably stretching the body of said fabric between selvedges by said uncurling means;

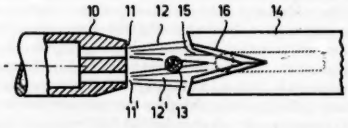


and adjustment means for adjusting the included angles between the lines of contact of the uncurling members on the fabric and said longitudinal edges of said fabric.

3,899,809
YARN CLAMPING DEVICE

Klaus Haberkern, Uster, Switzerland, assignor to Zellweger, Ltd., Uster, Switzerland

Filed Sept. 5, 1973, Ser. No. 394,455
Claims priority, application Switzerland, Dec. 19, 1972, 18478/72
Int. Cl.[2] D01H *13/16*
U.S. Cl. 28—64 4 Claims



1. A yarn clamping device for holding the end of a running yarn in place in a textile machine, comprising,

means disposed adjacent the running yarn for projecting at least one stream of compressed air at the yarn, and

a yarn holder including at least one plate having an edge disposed adjacent said running yarn on the opposite side thereof from said means projecting said compressed air stream, said plate having a wedge-shaped notch along which the loose end of a broken or severed yarn is urged by said compressed air stream around said edge, said notch acting as a guide for enabling said loose end to be held in place in a direction transverse to the direction of the running yarn, wherein

said means for projecting at least one stream of compressed air comprises a nozzle having two air passages to which compressed air is supplied to provide two streams of compressed air, said nozzle being disposed with said running yarn positioned at a point between said air streams so as to intercept a portion of each stream, said wedgeshaped notch facing said running yarn and said plate lying in a plane transverse to said running yarn.

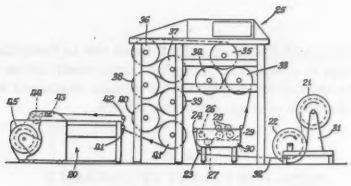
3,899,810
METHOD OF MAKING CHEMICALLY PROTECTED OFF-THE-LOOM FABRICS

Leonard A. Stanley, Charlotte, N.C., and Glynn E. Fouche, Jr., Rock Hill, S.C., assignors to The Kendall Company, Walpole, Mass.

Continuation-in-part of Ser. No. 221,308, Jan. 27, 1972, abandoned, which is a continuation-in-part of Ser. Nos. 36,037, May 11, 1970, abandoned, and Ser. No. 36,038, May 11, 1970, abandoned. This application Feb. 14, 1974, Ser. No. 442,603

Int. Cl.² D02G *3/36*; D06M *13/00*

U.S. Cl. 28—72.6 **4 Claims**



1. A method of making chemically protected off-the-loom fabrics comprising

treating unsized cellulosic warp yarns in a water bath with a water compatible size containing a non-volatile substantially cold water insoluble chemical protecting material

drying the sized and chemically protected warp yarns and

interweaving said warp yarns with unsized and untreated cellulosic filling yarns to provide an off-the-loom fabric

exposing said fabric to moisture to cause partial transfer of said chemical protecting material from said warp yarns to said filling yarns to chemically protect the entire fabric without further treatment thereof.

3,899,811
CRIMPING OF SYNTHETIC PLASTIC FILAMENTS

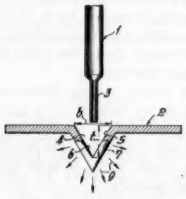
Ernst Bauch, Bordesholm, Germany, assignor to Neumunstersche Maschinen-und Apparatebau GmbH, Neumunster, Germany

Division of Ser. No. 381,493, July 23, 1973. This application July 3, 1974, Ser. No. 485,735

Claims priority, application Germany, July 22, 1972, 2236024

Int. Cl.² D02G *1/16*

U.S. Cl. 28—72.12 **7 Claims**



1. In a method of crimping a synthetic plastic filament, the steps of moving a synthetic plastic filament in plastic state in a predetermined first path; advancing an apertured contact element in a second path which is located in a plane extending transverse to and intersecting said first path; and intercepting the moving filament in a recess formed in said advancing contact element, to confine said filament in said recess of the advancing contact element and thereby effect crimping of said filament.

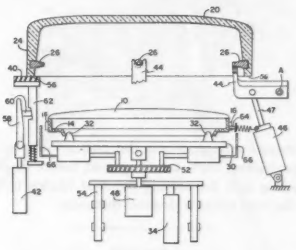
3,899,812
AUTOMATIC APPARATUS FOR INSERTING A CRT MASK INTO ITS MATING PANEL

Ronald S. Baranski, Round Lake, and Leslie L. Baur, Glen Ellyn Countryside, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Division of Ser. No. 410,142, Oct. 26, 1973, Pat. No. 3,838,483. This application June 27, 1974, Ser. No. 483,729

Int. Cl.² H01J *9/00*

U.S. Cl. 29—25.19 **2 Claims**



1. Mask insertion apparatus for inserting a cathode ray tube mask assembly into a cathode ray tube front panel having alignment studs for engagement with alignment holes formed in leaf-type springs mounted on the mask assembly, comprising:

a mask assembly platen for receiving and supporting a mask assembly at a predetermined rough location on the platen with its convex side facing upwardly;

means for lowering the platen from a first operating location where it receives a mask assembly to a second lower operating location;

means positioned at said second operating location for precisely positioning and aligning the mask assembly so that the alignment holes are forced to lie in a substantially horizontal hole reference plane, each hole positioned at a predetermined location;

first panel support means for receiving and supporting a panel in a roughly horizontal position above and in rough vertical alignment with the mask assembly with the convex panel surface facing upwardly;

stud alignment means for placing the panel studs in a substantially horizontal stud reference plane such that each stud is in vertical alignment with its corresponding mask alignment hole and at a common predetermined vertical height above said hole;

second panel support means for supporting the panel in its precisely aligned position;

compressing means for compressing the mask springs and holding the mask assembly in its aligned position;

means for elevating the mask assembly platen said predetermined height to its first operating location where the panel studs and mask alignment holes lie in substantially horizontal alignment; and

means for releasing said compressing means to allow the mask springs to deflect outwardly and cause engagement of the panel studs with the mask alignment holes.

3,899,813
SLOTTING CUTTER APPARATUS

Norman H. Lovendahl, 814 N. Clinton, River Forest, Ill. 60305

Filed Dec. 13, 1973, Ser. No. 424,376

Int. Cl.² B26D *1/12*

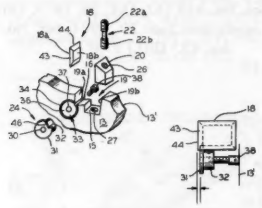
U.S. Cl. 29—105 R **17 Claims**

1. Slotting cutter apparatus,

said apparatus comprising a cutter body,

said cutter body having oppositely disposed end faces and a plurality of peripheral slots extending through said body and end faces to receive insert blades therein,

retaining means for retaining said insert blades in said peripheral slots with said insert blades protruding beyond said end faces on at least one side to effect a machine cut, and



locator means mounted into the cutter body proximate to said peripheral slots abutting said insert blades on said protruding side for setting the said blades to extend beyond the end faces a desired distance.

3,899,814

TOOL FOR MACHINING ROUND SECTIONS

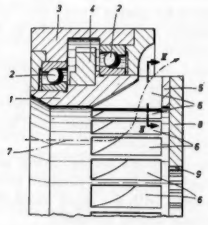
Bruno Kralowetz, St. Ulrich 142, Steyr, Austria

Filed May 22, 1974, Ser. No. 472,493

Claims priority, application Austria, June 25, 1973, 5571/73

Int. Cl.[2] B26D *1/12*

U.S. Cl. 29—105 R **3 Claims**



1. A tool arrangement comprising:

a. a drum member having an axis and formed with an axially open cavity, said drum member having an axially terminal portion;

b. a bearing engaging an axial portion of said drum member spaced from said terminal portion for rotation of said drum member about said axis,

1. the portion of said drum member axially intermediate said engaged portion and said terminal portion being formed with a plurality of openings extending radially therethrough;

c. an annular cutter mounted on said terminal portion and including a plurality of cutting edges directed in a radially inward direction; and

d. fan means on said drum member for drawing a stream of air from said cavity radially outward through said openings when said drum member rotates about said axis.

3,899,815

THERMAL BED SCREEN PACK

James P. Maddox, Sherman Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 28, 1973, Ser. No. 401,922

Int. Cl. B23k *31/02*

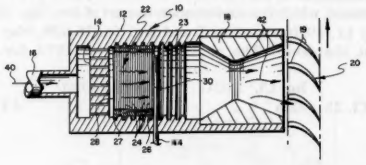
U.S. Cl. 29—163.5 R **8 Claims**

1. A method to fabricate a thermal bed screen pack comprising the steps of:

stacking a multiplicity of individual wire mesh discs;

compressing said stack of wire mesh discs to form said pack;

forming. metallurgically, a solid rim portion around the peripheral edges of said compressed stacked discs to trap each individual disc within said metallurgically formed rim; and



machining said metallurgically formed rim to form threads therein to enable said threaded compressed screen pack to be threadably engaged with threads machined in the interior wall of a gas generator device.

3,899,816

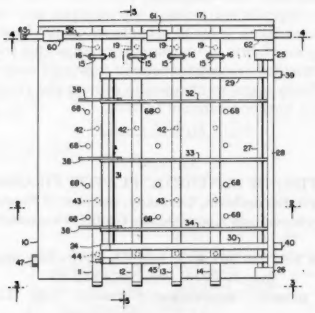
PRESS FOR PALLET DISASSEMBLY

Donald G. Jennings, Staten Island, N.Y., assignor to Distribution Supply Corporation, Westfield, N.J.

Filed July 12, 1974, Ser. No. 483,304

Int. Cl.[2] B23P *19/00*

U.S. Cl. 29—200 D **8 Claims**



1. A press for the disassembly of pallets having stringers to which top and bottom boards are fixed, said press comprising, in combination,

a. a base having a back and a front,

b. fingers extending from the back of said base over said base so that a pallet may be placed about said fingers with the fingers extending above the pallet bottom boards and below the pallet top boards,

c. stringer hold downs having downward projections to extend between top boards of a pallet and to engage stringers of a pallet,

d. means removably mounting said stringer hold downs,

e. means locking said stringer hold downs in a stringer engaging lower position,

f. a first set of cylinders mounted under said base along the lengths of said fingers,

g. means activating said first set of cylinders raising said fingers removing top boards of a pallet while said stringer hold downs secure the stringers of a pallet,

h. front and back finger hold downs securing said fingers in a lower position,

i. a second set of cylinders under said base, and

j. means activating said second set of cylinders to raise stringers of a pallet while said front and back finger hold

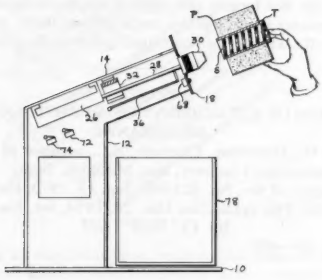
downs secure said fingers in a lower position to remove the stringers from bottom boards of a pallet.

3,899,817

MEANS FOR TRANSFERRING YARN PACKAGES FROM A WINDING TUBE TO A CORE FOR DYEING

Graham F. Clifford, Stanley, N.C., and Mack W. Spurrier, Clover, S.C., assignors to Gaston County Dyeing Machine Co., Mount Holly, N.C.

Filed Feb. 19, 1974, Ser. No. 443,629
Int. Cl. B23p *19/02*
U.S. Cl. 29—234 **7 Claims**



1. Apparatus adapted particularly for transferring a yarn package from a core tube on which it has been wound to a core suitable for supporting the package for dyeing, said apparatus comprising a plate member proportioned for endwise support of said wound yarn package while being apertured for clearing the core tube on which said package is wound, an expandable chuck mounted for reciprocation perpendicularly in relation to said plate member between an initial position at which said chuck is extended through said plate member aperture sufficiently for receiving and interiorly gripping an adjacent end portion of the core tube carrying a yarn package supported on said plate member and a retracted position at which said chuck is withdrawn from such extension sufficiently to space it from said plate member in excess of the axial length of said core tube, and means for selectively expanding said chuck and causing the same to move between said initial and retracted positions, said means including an element positioned on said plate member for displacement by a yarn package placed for support on said plate member, and said element operating upon said displacement to trigger sequential expansion and retraction of said chuck.

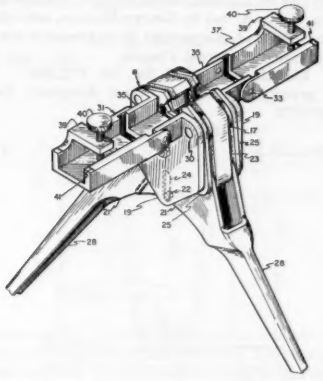
3,899,818

SURVEYORS TAPE REPAIR TOOL

Ben Castaneda, 849 Camino Consuelo, and Norbert A. Staab, 1130 Camino Delora, both of, Santa Fe, N. Mex. 87501

Filed Aug. 21, 1974, Ser. No. 499,218
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—243.56 **4 Claims**

1. A manually operated portable surveyors metal tape repair tool comprising means for confining, and means for clamping, the broken ends of the tape respectively in longitudinal alignment and in selected longitudinal non-overlapping position within a malleable metal trough, two-handled plier-like means for straddling the metallic metal trough when open, and for upsetting when closed, the malleable metal trough for tightly enclosing the broken end portions of the tape in a malleable metallic sleeve and for impressing at least one pair of crimps in the sleeve so formed and the enveloped tape ends



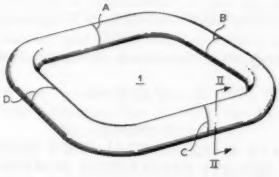
at right angles to the direction of elongation of the tape, on each side of the broken tape ends.

3,899,819

METHOD FOR MANUFACTURING CURVED TUBE SECTIONS

John David Bertil Ostbo, Byvagen 38, S-151 52 Sodertalje, Sweden

Continuation of Ser. No. 137,160, April 26, 1971, abandoned.
This application Apr. 2, 1973, Ser. No. 347,030
Claims priority, application Sweden, July 16, 1970, 9881/70
Int. Cl. B23k *31/02*
U.S. Cl. 29—407 **5 Claims**



1. A method of manufacturing curved tube sections of a rigid material, comprising in sequence the steps of,

a. manufacturing by plastic deformation of flat sheet metal stock a plurality of tube segments, each of said tube segments having a cross-section which comprises a portion of a circle,

b. joining by welding said segments into a tubular loop completely closed in both longitudinal and circumferential directions, each tube segment corresponding to a portion of the cross-section of said loop, and said loop being circular in cross-section, and then

c. dividing said loop into a plurality of tube sections by cutting along planes transverse to said longitudinal direction.

3,899,820

METHOD OF PRODUCING A DISPERSION-STRENGTHENED ALUMINUM ALLOY ARTICLE

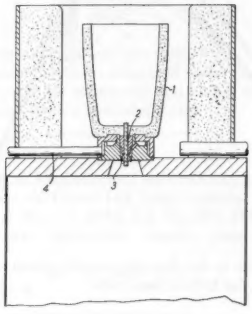
Peter John Read, South Newington, near Banbury; Keith Graham Latimer, Greatworth; Terence David Warren Reynolds, Daventry, all of England; David Munson, deceased, late of Wruxton, England, and by George Munson, administrator, Rochester, England, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed June 21, 1973, Ser. No. 372,204

Claims priority, application United Kingdom, June 30, 1972, 30876/72

Int. Cl. B22f *3/24*

U.S. Cl. 29—420.5 **8 Claims**



1. A method of producing an aluminium alloy article having a high hot strength comprising establishing a substantially homogeneous body of molten metal comprising aluminium and 0.05 to 25 percent of alloying constituent, the amount of said alloying constituent being in excess of the equilibrium solid solubility, the maximum value of the equilibrium solid solubility being 2 percent, said alloying constituent having a low diffusion rate in aluminium, establishing a stream of droplets of said molten metal in a stream of unheated gas, said droplets having an average diameter in the range of 50 μm to 1 mm, projecting said droplets against a substrate, undercooling said droplets of molten metal by at least 50°C during flight so that on striking the substrate they are very rapidly solidified to maintain said alloying constituent in supersaturated solid solution or in the form of particles of a size not greater than 1 μm in said aluminium, and compacting the mass of droplets by hot working at a temperature in the range of 200° to 500°C.

3,899,821

METHOD OF MAKING METAL PIECE HAVING HIGH DENSITY FROM METAL POWDER

Sunji Ito; Yasuaki Morioka; Yoshihiro Kajinaga; Ichio Sakurada, Chiba, and Minoru Nitta, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

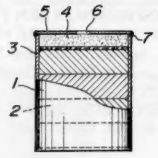
Filed Aug. 8, 1974, Ser. No. 495,631

Claims priority, application Japan, Aug. 9, 1973, 48-88775

Int. Cl.² B22F *3/24*

U.S. Cl. 29—420.5 **7 Claims**

1. A method of making a macroscopically homogeneous metal piece having a high density from metal powder, comprising the steps of compacting metal powder to obtain compacts, stacking said compacts one upon the other in a metallic container having an upper open end, disposing a perforated carburizing protecting plate and a solid reducing agent in succession on said stacked compacts so that said solid reducing agent does not directly touch said metal compacts, said solid reducing agent upon heating generates and maintains an oxidation protecting atomosphere, closing said upper open end of said container by means of a cover plate made of metal and having a degassing gap so that the conainer is otherwise sealed, heating said stacked compacts together with said con-



tainer at a temperature from 1,000°C. to 1,300°C in atmospheric air, hot forging said stacked compacts together with said container in atmospheric air to deform them, and finally cutting off said deformed container to obtain the metal piece.

3,899,822

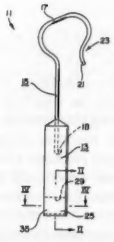
METHOD OF ATTACHMENT OF A PROSTHESIS TO A MEMBRANE

Beverly W. Armstrong, Charlotte, N.C., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.

Division of Ser. No. 323,940, Jan. 15, 1973, Pat. No. 3,838,468. This application Mar. 20, 1974, Ser. No. 452,827

Int. Cl.² B23P *11/02*

U.S. Cl. 29—450 **1 Claim**



1. A method of attaching the distal end of a prosthesis to membrane structure for use in otological surgery to replace the stapes of the middle ear comprising the steps of providing a jig fixture having an upwardly directed ridge, providing the distal end of the prosthesis with a pair of leg means for gripping the membrane structure, placing the membrane structure over said ridge of said fixture with said ridge restingly supporting a portion of the membrane structure intermediate remote edges thereof, placing the distal end of said prosthesis upon said jig fixture with the membrane structure being sandwiched therebetween, thrusting said prosthesis downwardly while being supported in a substantially upright position to drive said ridge and a bight portion of the membrane structure between said pair of legs of said prosthesis, and withdrawing said prosthesis from said jig fixture with the bight portion of the membrane structure being grippingly attached to said prosthesis.

3,899,823

AIR CONDUIT AND DIFFUSER ASSEMBLY

Robert R. Lambert, Glendora, Calif., assignor to Wehr Corporation, Milwaukee, Wis.

Division of Ser. No. 2,112, Jan. 12, 1970, Pat. No. 3,823,652. This application Mar. 25, 1974, Ser. No. 454,099

Int. Cl. F24f *7/06*

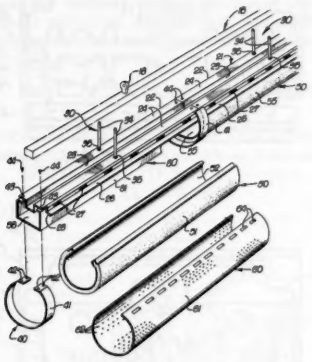
U.S. Cl. 29—455 **5 Claims**

1. A method of assembling and mounting an air conduit and

diffuser assembly below a ceiling of a room comprising the steps of:

securing attaching means to the ceiling;

mounting support panel sections to the attaching means with the ends of the sections adjacent each other;



securing an alignment band between the adjacent ends of adjacent support panel sections to form a support panel;

inserting tubular duct sections between the alignment bands and under the support panels to form a tubular duct having a central cavity for carrying air from a supply to be diffused throughout the rooms.

3,899,824

METHOD AND APPARATUS FOR SHEATHING CABLE CORES

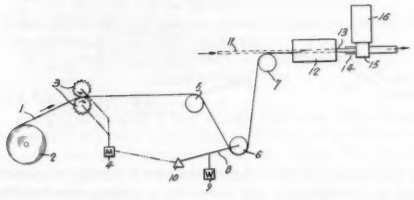
Shirley M. Beach, North Vancouver, Canada, assignor to Phillips Cables Limited, Brockville, Canada

Filed July 2, 1973, Ser. No. 375,646

Claims priority, application Canada, July 6, 1972, 146559

Int. Cl. B23p *3/00*

U.S. Cl. 29—458 **12 Claims**



1. A method of sheathing a cable core advanced longitudinally, with a flat strip of sheathing material, comprising:

advancing said strip and advancing said cable core,

crimping said strip to give it inherent longitudinal stretchability, the crimps extending inwardly from the longitudinal edges of the strip, stretching the crimped strip longitudinally to the point where the crimp is removed to substantially the maximum where the longitudinal edges of the strip are of substantially equal effective length and wrapping the strip longitudinally about the cable core to form a sheath in which the longitudinal edges of the strip overlap.

3,899,825

METHOD AND MEANS FOR CONNECTING ELECTRICAL CONDUCTORS TO RAILROAD RAILS

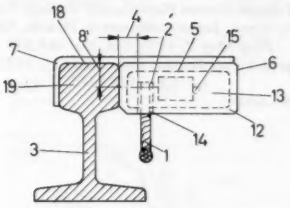
Peter Hofer, Hofen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Oct. 4, 1972, Ser. No. 294,922

Claims priority, application Switzerland, Oct. 8, 1971, 14701/71

Int. Cl.² B23K *21/00*

U.S. Cl. 228—107 **22 Claims**



1. Apparatus for making a permanent mutual electrical connection of a conductor and a railroad rail, comprising a conductive adaptor, carrying means having a first region for receiving an explosive charge and a second region disposed in spaced relation to the first region for receiving the conductor and the adaptor, said carrying means embracing said regions, means for positioning the carrying means relative to the rail such that the second region is disposed between the first region and the rail, and means for detonating the charge to explosively weld the adaptor to the rail and to simultaneously explosively weld the conductor to the adaptor, said carrying means including a housing, said housing being formed of foam plastic.

14. A method of making a permanent electrical connection between a conductor and a railroad rail which comprises the steps of positioning both the conductor and a conductive adaptor between the rail and an explosive charge, and thereafter detonating the charge to explosively weld the adaptor to the rail and to simultaneously explosively weld the conductor to the adaptor, the adaptor comprising a plate, and the positioning step comprising disposing the conductor between the plate and the rail and disposing the charge adjacent the plate.

3,899,826

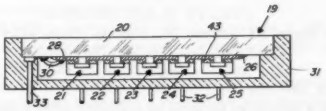
SCANNABLE LIGHT EMITTING DIODE ARRAY AND METHOD

Malcolm J. Russ, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 209,838, Dec. 20, 1971, Pat. No. 3,800,177. This application Nov. 1, 1973, Ser. No. 411,614

Int. Cl. B01j *17/00*

U.S. Cl. 29—583 **5 Claims**



1. A method of manufacturing an integrated light display comprising the steps of:

a. forming one electrode of a plurality of light emitting diodes in a first surface of a semiconductor substrate of the type opposite to that forming the conductivity of the formed electrode;

b. electrically interconnecting rows of said electrodes by interconnection means having an annular opening over each of said electrodes;

c. securing said first surface of the semiconductor substrate and the electrical interconnecting means to a plate of transparent dielectric material; and

d. separating the opposite surface of the substrate into a plurality of sections to electrically isolate the other electrode of the light emitting diodes from like other electrodes.

3,899,827

METHOD OF MANUFACTURING POLE PIECE ASSEMBLY FOR ELECTROMAGNETIC TYPE PICKUP

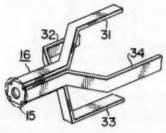
Norihiko Takami; Osamu Hattori, and Manabu Wakabayashi, all of Toyokawa, Japan, assignors to Hitachi, Ltd., Japan

Filed May 9, 1974, Ser. No. 468,575

Claims priority, application Japan, May 11, 1973, 48-51738

Int. Cl. G11b *5/42*

U.S. Cl. 29—603 **4 Claims**



1. A method of manufacturing a pole piece assembly for an electromagnetic-type pickup, said pole piece assembly being the type having two pairs of facing pole pieces, comprising the steps of:

stamping a pole piece unit from a thin plate of magnetic material, said pole piece unit having four arms extending outwardly from a joint portion with opposite ones of said arms from said joint portion being joined symmetrically with said joint portion,

bending said four arms into a predetermined shape with said opposing ones of said arms being maintained in opposing relationship across said joint portion with respect to each other,

subjecting said pole piece unit bent is said predetermined shape to magnetic annealing,

thereafter inserting said bent pole piece unit into a fixing member of non-magnetic material, said fixing member having a hollow recess for receiving said joint portion and the bent arms of said pole piece unit thereinto,

securing said bent pole piece unit in said fixing member such that said opposing ones of said arms adjacent said joint portion are maintained in position with respect to said fixing member, and

severing said joint portion from said pole piece unit to separate said opposing ones of said arms from said joint portion, thereby forming two pairs of spaced pole pieces from said opposing ones of said arms.

3,899,828

UTILITY BLADE HOLDER

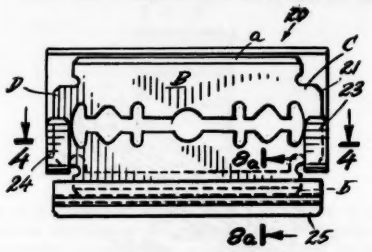
Joseph Bosco, 33 Summer St., Everett, Mass. 02149

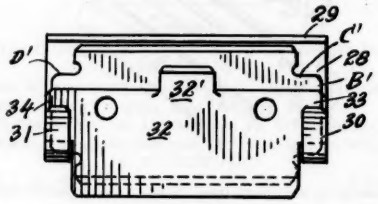
Filed Jan. 2, 1974, Ser. No. 430,096

Int. Cl.[2] B26B *5/00, 29/00*

U.S. Cl. 30—151 **2 Claims**

1. In a device to be used as a cutting tool, comprising, in combination, a vertical flat wall, and means to support a razor blade against said flat wall, a blade having cutting edge, said supporting means including a pair of inverted vertical extensions mounted on either side of said flat wall and extending beyond said wall, said extensions formed in such a manner as to hold and to support securily said razor blade against said flat wall; and including an elongated bar, said bar having a pair of grooves running the entire length of said bar, one groove in said pair located over the other groove and running parallel to the first groove, by means of the first groove said bar being mounted over the cutting edge of said blade for safety purposes when said device is not being utilized as a cutting tool, the other groove in said pair having a tapered cross-section, said bar being removed from the cutting edge of said blade to





expose said cutting edge when said device is being utilized as, a cutting tool, said bar, by means of said tapered groove being anchored stationary to said device away from the cutting edge of the razor blade aforesaid.

3,899,829

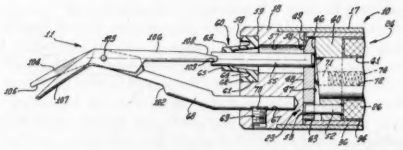
HOLDER AND ACTUATOR MEANS FOR SURGICAL INSTRUMENTS

Fred K. Storm, Glendale, and Eldridge H. Smiley, Rosemead, both of Calif., assignors to Fred Storm Industrial Designs, Inc., Los Angeles, Calif.

Filed Feb. 7, 1974, Ser. No. 440,498

Int. Cl.[2] B26B *7/00, 15/00*

U.S. Cl. 30—228 **8 Claims**



1. In an actuator and holder means for a cutting instrument useful in microsurgery and including a cutting member, the combination of:

holder means including a housing having a chamber therein;

actuator means for imparting cutting motion to said cutting member including

a pin adapted to be operably connected at one end with said cutting member,

a transversely disposed element connected to said pin in spaced relation to said one end and located within said chamber and movable with the pin,

said transversely disposed element being mounted for pivotal movment about an axis spaced from the axis of the pin,

said transversely disposed element comprising a disc-like element,

one face of said disc-like element being beveled from a chord line spaced from the center of the element and spaced from the axis of the pin member to provide clearance for said pivotal movement,

said disc-like element including a planar face opposite to said face having said bevel,

spring means in contact with said planar face biasing said disc-like element in the direction of said pin,

and means carried by the housing and cooperable with said transversely disposed element to impart forward and backward motion to said pin and element whereby a cutting edge on said cutting member is imparted cutting motion of restricted scope.

3,899,830

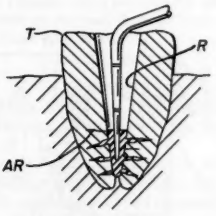
ENDODONTIC SEALING SYSTEM AND APPARATUS

Oscar Malmin, 127 E. Wayne Ave., Akron, Ohio 44301

Filed Dec. 30, 1971, Ser. No. 213,993

Int. Cl. A61k *5/02*

U.S. Cl. 32—15 **10 Claims**



1. A sealing plug intended to be grasped by a dental instrument and inserted into a root canal for sealing said root canals, comprising;

A. an elongate shank having first and second ends with said first end being adapted to engage said instrument; and

B. a projecting substantially conically shaped solid enlarged end of substantially compressible material having its base secured to said second end of said shank and adapted to be inserted into said canal.

3,899,831

PLATE LENGTH MEASURING GAGE

Walter L. DeLeon, Pasadena, Tex., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 12, 1973, Ser. No. 396,640

Int. Cl. G01b *7/04*

U.S. Cl. 33—141 B **2 Claims**

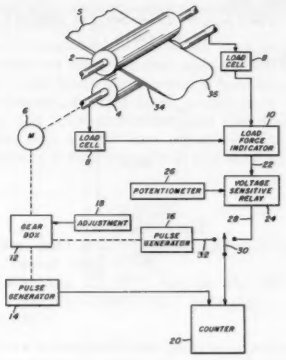
1. In a rolling mill, a pair of opposed work rolls, means for measuring the force separating said work rolls when a workpiece is displaced therebetween, and a gage for measuring usable lengths of a workpiece as it passes between the work rolls comprising,

means connected to a work roll for providing pulses representative of increments of length of the circumference of the work roll as the work roll rotates,

means connected to said means for providing pulses for counting said pulses,

a voltage sensitive relay and signal source connected to the means for measuring the force separating said rolls and the means for counting the pulses for supplying a signal to said means for counting the pulses whenever the means for measuring the force separating said rolls indicates that the workpiece is entirely between said rolls, and

a potentiometer connected to said means for counting pulses and said voltage sensitive relay and signal source whereby when the force of the rolls upon the workpiece causes the means for measuring the force separating the work rolls to measure an increase in force to a value



determined by a setting of said potentiometer said signal source is connected to said means for counting pulses.

3,899,832

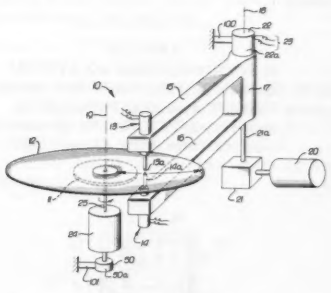
PHONOGRAPH RECORD PROFILE TRACER

Csaba K. Hunyar, Sunland, Calif., assignor to United Artists Music and Records Group, Inc., Los Angeles, Calif.

Filed Mar. 11, 1974, Ser. No. 450,049

Int. Cl. G01b *5/20*

U.S. Cl. 33—174 P **6 Claims**



1. In combination with a phonograph record, record profile testing apparatus comprising

a. a turntable substantially undersized relative to the record overall diameter for supporting the record with opposite sides thereof exposed,

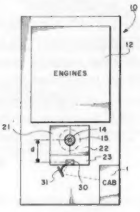
b. a pair of transducers including sensors at locations spaced to receive the turntable supported record therebetween, to simultaneously engage opposite sides of the record and to produce electrical signals which vary in response to movement relative to the sensors of record surface portions engaged by the sensors and generally normal to the plane of the record, the sensors having record engaging tips at locations spaced apart along a direction which is generally normal to said plane, and

c. structure carrying said transducers at said locations, and means to displace said structure to carry the transducer tips generally radially across the record.

3,899,833
METHOD AND APPARATUS FOR ALIGNING A DRILL BIT OVER A PREDETERMINED POINT

Reece E. Wyant, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 9, 1974, Ser. No. 495,942
Int. Cl. G01b *11/27*
U.S. Cl. 33—228 **7 Claims**



1. Apparatus for aligning the drilling axis of a mobile drilling rig with a stake in the earth's surface indicative of the desired drilling location, comprising:

a sight board adjacent the earth's surface and pivotally attached to said stake, the location of said pivot being between the first and second ends of said board, said board having a sight mark on a first end displaced from said pivot by a predetermined amount;

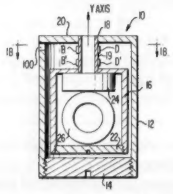
a line attached at its first end to the second end of said sight board and anchored at its second end at a remote point stretched out along the length of said line;

a sight tube mounted on said drilling rig, the projection of the longitudinal axis of said sight tube intersecting the earth's surface at a point displaced from the drilling axis of said drilling rig by the said predetermined amount; and means to drive said drilling rig along said line until said sight tube is aligned with said sight mark on said sight board.

3,899,834
ELECTRONIC COMPASS SYSTEM

Earnest R. Harrison, Jr., Glen Burnie, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 2, 1972, Ser. No. 294,134
Int. Cl. G01c *21/20, 9/06, 17/30*
U.S. Cl. 33—352 **12 Claims**



1. A compass assembly powered from an electrical driver circuit, comprising in combination:

non-magnetic support means including a fixed reference axis;

a cantilever beam member having one end rigidly attached to said support means;

a weight under the influence of the earth's gravitational field attached to the other end of said beam member;

an electrical accelerometer assembly mounted on said beam member and responsive to the stress upon said beam member caused by said weight for a specific orientation in space to provide a first plurality of output signals corresponding to the three components of the earth's gravitational field relative to a predetermined coordinate system of said support means including said fixed reference axis;

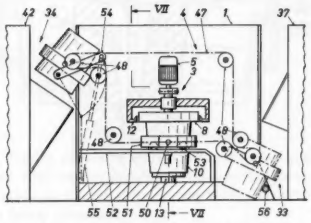
a flux gate magnetometer assembly supported from said support means and energized from said driver circuit, providing a second plurality of output signals corresponding to the three components of the earth's magnetic field with respect to said predetermined coordinate system; and

data processor means coupled to said accelerometer and magnetometer assemblies for computing the heading of the projection of said reference axis onto the horizontal plane with respect to the projection of the earth's magnetic field onto the horizontal plane from said first and second plurality of output signals.

3,899,835
DEWATERING APPARATUS

Arnfried Meyer, Neckargartachertrasse, 7101 Frankenbach, Germany

Filed Nov. 13, 1973, Ser. No. 415,325
Claims priority, application Austria, Nov. 13, 1972, 9642
Int. Cl. F26b *17/24*
U.S. Cl. 34—58 **33 Claims**



1. An apparatus for the cyclic extraction of a liquid from articles, which includes a loading station means and an unloading station means, comprising: a plurality of container means for receiving the articles from which the liquid is to be extracted, means for extracting the liquid from the articles disposed in said container means, means operatively connected with said container means for selectively guiding said container means from the loading station means to said extracting means and from said extracting means to the unloading station means, and transporting means independent of said extracting means for transporting one of said plurality of container means from said extracting means to the unloading station means during the extraction of another of said plurality of container means disposed in said extracting means.

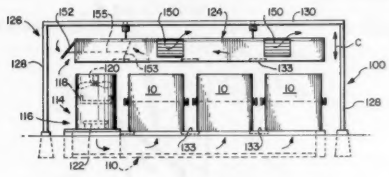
3,899,836
MODULAR TOBACCO HANDLING AND CURING SYSTEM AND METHOD

William H. Johnson, Raleigh, N.C., assignor to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 288,028, Sept. 11, 1972, abandoned. This application Aug. 15, 1973, Ser. No. 388,590
Int. Cl. F26b *19/00*
U.S. Cl. 34—225 **12 Claims**

1. A curing station for tobacco curing modules, the modules having closed sidewalls and top and bottom walls open for the passage of gas through the modules substantially from sidewall to sidewall thereof, comprising a generally horizontal foundation, plural openings in the upper surface thereof each sized to edge support a curing module thereover, and said plural openings in said upper surface being coextensive with the open top and bottom walls of the tobacco curing modules, a further opening in the upper surface, a hot air furnace means supported over the said further opening, gas passages in the

foundation connecting the plural openings and the said further opening for the passage of heated gases there-between, a top plenum chamber substantially coextensive with the orizontal foundation, means associated with the top plenum chamber providing sealing engagement with the top of the hot air furnace and the tops of modules supported on the foundation and air passages in the top plenum chamber connecting the hot air



furnace and the tops of the modules, plural openings in the top plenum chamber coextensive in number with the number of curing modules and coextensive in size with the top openings in the modules, whereby air from the hot air furnace flows through the gas passages then uniformally substantially vertically from sidewall to sidewall through each of said modules and said top plenum chamber.

3,899,837

EDUCATIONAL APPARATUS

Rodney David Harnett, 13 Kenmore Close Kew Green, Richmond, England

Continuation of Ser. No. 200,863, Nov. 22, 1971, abandoned. This application July 10, 1973, Ser. No. 377,920
Claims priority, application United Kingdom, Nov. 27, 1970, 56409/70; Mar. 29, 1971, 8063/71
Int. Cl. G09b *19/22*
U.S. Cl. 35—8 B **2 Claims**

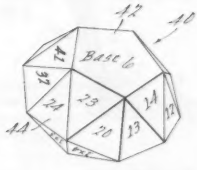
1. Bridge teaching apparatus comprising in combination:
a four-sided card table providing the North, South, East and West playing positions required in the game of Bridge;
a pack of playing cards having the usual suit and value markings on the faces thereof and, on their backs, deal marks dividing the pack into four hands, North, South, East and West by indicating to which of said playing positions each card is to be dealt;
a four-track tape recording having mutually isolated North, South, East and West commentaries in parallel thereon, correlated with said pack by having said commentaries corresponding to a game of Bridge played with said pack dealt according to said deal marks;
four-track tape playback means mounted on said table for playing said recording to provide mutually isolated parallel playbacks of said commentaries;
four separate personal sound transducers, North, South East and West, each provided at a respective one of said playing positions; and
four separate signal paths connected from said tape playback means to respective ones of said sound transducers, whereby said North commentary is hearable only in said North transducer, said South commentary is hearable only in said South transducer, said East commentary is hearable only in said East transducer, and said West commentary is hearable only in said West transducer.

3,899,838

TEACHING AID

John J. Lalley, and Laurel E. Lalley, both of 3971 Causeway Dr. N.E., Lowell, Mich. 49331

Filed Dec. 13, 1973, Ser. No. 424,295
Int. Cl.² G09B *19/02;* **A63F** *9/04*
U.S. Cl. 35—31 G **9 Claims**



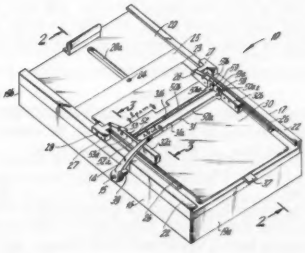
1. A teaching aid comprising a plurality of polyhedrally shaped blocks, said blocks comprising differing numbers of sets of parallel side surfaces, each of said sets of surfaces including a first surface having first display means located thereon and defining a problem to be solved, and a second surface having second display means located thereon and providing an answer to said problem.

3,899,839

WRITING IMPLEMENT FOR PERSONS WITH GREATLY IMPAIRED OR LOST EYESIGHT

Carl J. Essmann, 82-38 235th St., Queens Village, N.Y. 11427

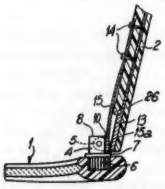
Filed June 20, 1974, Ser. No. 481,135
Int. Cl.² G09B *21/00*
U.S. Cl. 35—38 **21 Claims**



1. A writing implement for persons with partially or totally impaired eyesight comprising, a guide plate overlaying a writing surface and having a transversely disposed slot, a pair of spaced parallel guide bars disposed within said slot and transversely disposed to said plate, and wherein the bar spacing is sufficient for the insertion of a handwriting instrument therebetween, and means for retractably moving at least one of said guide bars toward a transverse edge of said slot upon exertion

of the pressure of the handwriting instrument on said one of said guide bars, wherein said means for retractably moving one of said guides comprises means to retain said bars in fixed spaced relationship, means connected to the retainer means to permit movement of said retainer means, towards and away from the transverse slot edge, and spring means operatively connected to said retainer means so that both of said guides retractably move toward one of said transverse slot edges with exerted pressure of a handwriting instrument on one of said guides.

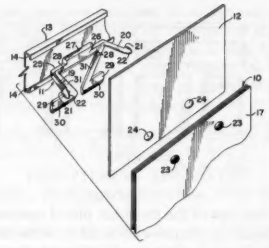
3,899,840
FRAMES FOR SPECTACLES
Rene Louis Maillet, 1 rue Saint Nicolas, Redon, France
Filed July 30, 1973, Ser. No. 383,543
Claims priority, application France, Aug. 2, 1972, 72.27844
Int. Cl. G02c *5/16, 5/22*
U.S. Cl. 351—113 **13 Claims**



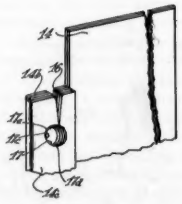
1. A spectacles frame comprising
a face
side pieces each connected to said face,
first hinge knuckles on said face and second hinge knuckles on said side pieces,
said first hinge knuckles on said face each being a facet carrying block and said second hinge knuckles on said side pieces each being a forked member having at least two prongs joined by a bridging portion,
a hinge pin connecting each second hinge knuckle forked member to a first hinge knuckle facet carrying block,
said first hinge knuckle having two facets disposed parallel to the axis of said hinge pin,
a resilient strip secured to each of said side pieces and having a free end bearing against one or the other of said two facets of said first hinge knuckle depending upon the relative angular orientation of said face and said side piece about said hinge pin,
said free end of said resilient strip engaged between one of said facets of said first hinge knuckle and said bridging portion of said second hinge knuckle to limit pivoting movement of each of said side pieces away from said face.

3,899,841
COUPON DISPLAY AND CLIP THEREFOR
Sol J. Berger, 310 Melvin Dr., Northbrook, Ill. 60062
Filed Mar. 4, 1974, Ser. No. 447,731
Int. Cl. G09f *3/18*
U.S. Cl. 40—11 **10 Claims**

1. A display assembly of a stack of coupons on a supporting clip for mounting substantially vertically by insertion into a supporting edging having upper and lower flanges, said assembly comprising a plastic clip which is a one piece molded article, said clip having means for securing it to supporting edging by a spring action and to that effect said clip having a base the back surface of which terminates in a top edge and a bottom edge, said edges being parallel to one another and located at the topmost and the bottommost portions of the clip respectively when the base is in a vertical position, and said base being sufficiently flexible to permit flexing of the base to reduce the distance between the topmost edge and the bottommost edge of the base for insertion of the base of the clip between the flanges of a supporting edging by a frontal movement and upon a release of the flexing force said base of the clip snaps back under the natural resiliency of the material of said base to snap the top and bottom edges of the base into position between the flanges of the edging for releasably holding the clip on the edging; said base having prong means integral therewith and projecting forwardly from the base, a stack of disconnected superimposed substantially identical coupons having aligned perforations therethrough on said prong means with the prong means extending through the aligned perforations.



3,899,842
CARD POCKET SUPPORTING MEANS
Aaron H. Shneider, 2835 N. Western Ave., Chicago, Ill. 60618
Filed Mar. 29, 1974, Ser. No. 456,149
Int. Cl.² B42F *15/00*
U.S. Cl. 40—104.18 **2 Claims**



1. A pocket for records, cards or pictures comprising a sheet of transparent material folded over itself to form a first closed end of said pocket, the free edges of said sheet opposite to said first closed end being closed by a double return folding to form a second closed end and reinforced region, said first and second closed ends being connected by a pair of opposed open ends at right angles thereto, said double return folded edges being fastened together to impart stiffness and strength to said second closed end and reinforced region, the opposed lateral portions of said region each having a portion thereof removed to form a rectangular step having an edge parallel to said adjacent open end, said region having a circular opening formed therein adjacent each parallel edge, each of said steps having a key-slot cut therein from said parallel edge into said circular opening adjacent thereto in a non-radial relationship to said opening, said key-slot being wedge-shaped with the base of the wedge on said parallel edge and the tip of the wedge being positioned at said non-radial juncture of said key-slot and said opening, so that the periphery of said opening continues substantially complete whereby the support elements co-act with portions of said opening periphery remote from said juncture.

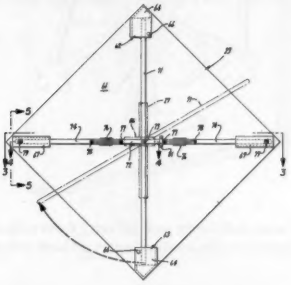
3,899,843
SIGNALLING DEVICE WITH A SIGN HAVING PROVISION FOR SPILLING OF WIND AND WITH A SUPPORT

Robert L. Doyle, and Montgomery C. Swezy, both of Palo Alto, Calif., assignors to Western Progress, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 689,514, Dec. 11, 1967, abandoned. This application May 8, 1969, Ser. No. 830,908

Int. Cl. G09f *07/18*

U.S. Cl. 40—125 G **5 Claims**



1. In a signalling device, a flexible sheet-like member, first and second arms, means pivotally interconnecting said first and second arms intermediate the ends of the same, said second arm having a length substantially less than the length of said first arm, first and second extension arms, means yieldably mounting said first and second extension arms on said second arm so that said first and second extension arms are normally disposed in alignment with said second arm, and means securing said sheet-like member to said first arm and to said first and second extension arms to support said sheet-like member in a relatively taut condition and so that at least portions of the sheet-like member are carried by the extension arms, said yieldable means permitting bending of portions of the sheet-like member when a predetermined wind load is placed on the sheet-like member to permit spilling of wind by the sheet-like member.

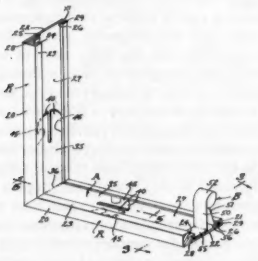
3,899,844
JOINT MEMBER AND RAIL WITH CLIPS FOR PICTURE FRAMING

Ben Munn, 8218 DeLongpre Ave., West Hollywood, Calif. 90046

Filed Sept. 21, 1973, Ser. No. 399,457

Int. Cl. G09f *1/12*

U.S. Cl. 40—156 **3 Claims**



1. The combination of picture framing rails and a picture mounting clip therefor: said rail comprising, an elongated body of uniform cross section with a decorative front and outside contour, a rearwardly disposed face at the inside to engageably receive a picture mounting, and an inside recess rearward of said face, said recess being defined by spaced and opposed front and back channels; a picture mounting of nominal thickness to engage upon said rearwardly disposed face; and said mounting clip comprising a continuous strip of spring material yieldingly separating a pair of mounting means and each of a tongue releasably engageable in one of said front and back channels respectively, one mounting means being offset by its tongue to releasably engage a thick picture mounting and reversly the other mounting means being offset by its tongue to releasably engage a thin picture mounting thereby engaging with a thick or thin picture mounting to secure it to the said rearwardly disposed face.

3,899,845
RECOILLESS WEAPON

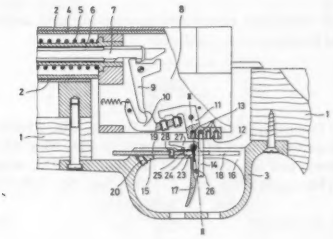
Hermann Wild, Ulm, and Arthur Rau, Westerstetten, both of Germany, assignors to J. G. Anschutz GmbH, Ulm, Danube, Germany

Filed Dec. 11, 1973, Ser. No. 423,865

Claims priority, application Germany, Dec. 15, 1972, 2261476

Int. Cl. F41c *19/00;* **F41b** *11/00*

U.S. Cl. 42—69 A **12 Claims**



1. A gun comprising a stock, a sear-like element operable to release a projectile discharging mechanism, a trigger and a recoil absorbing mass movable in an opposite direction to that in which a projectile is to be discharged, said trigger being pivotally mounted for movement about an axis fixed relative to the stock and said sear-like element being mounted upon and movable with said recoil absorbing mass, and a coupling element connecting said trigger and sear in a ready to fire position of the projectile discharging mechanism, said coupling element comprising an intermediate lever pivotally mounted on said recoil absorbing mass and operatively connected to the sear-like element and comprising an operating element which, in the ready to fire condition of the gun, lies within the path of movement of the trigger, said operating element comprising a pin adjustably secured to said intermediate lever.

3,899,846
REMOVABLE CONVERTER FOR A FISHING POLE WITH AUTOMATIC RELEASE FOR FISHING LINE

George R. Sanchez, 502 Berry Ave., Hayward, Calif. 94544

Filed Sept. 9, 1974, Ser. No. 504,448

Int. Cl. A01k *87/00*

U.S. Cl. 43—25 **3 Claims**

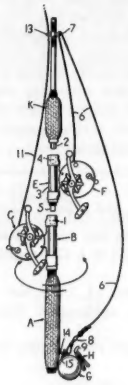
1. In combination:

a. a fishing pole having a handle and fishing reel removably connected to the pole;

b. said fishing reel having a fish line adapted to be wound on the reel;

c. a converter having a weight retrieving reel mounted thereon and having a weight retrieving line adapted to be wound thereon;

d. a weight connected to the weight retrieving line and having a quick release catch thereon for gripping the fishing line adjacent to the baited hook on the line;



e. and means for removably connecting said converter to said handle and to said pole.

3,899,847

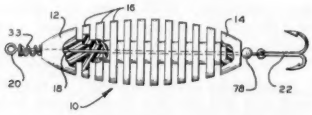
FISH LURE

Michael Dworski, 4708 Kane Pl., Jupiter, Fla. 33458

Continuation-in-part of Ser. Nos. 255,401, May 22, 1972, abandoned, and Ser. No. 260,112, June 6, 1972, abandoned. This application Jan. 2, 1974, Ser. No. 429,572

Int. Cl. A01k *85/00*

U.S. Cl. 43—42.09 **24 Claims**



1. An artificial minnow for association with the hooked end of a fishing line or leader, said minnow comprising:

a. a body having head and tail ends and a central portion;

b. said body being symmetrically arranged about a central, longitudinal axis curved in plan view and having an opening extending therethrough for loose passage of a line or leader; and

c. said central portion including a plurality of longitudinally spaced rib elements extending radially from said axis.

3,899,848

ANIMATED CARTOON CHARACTER AND METHOD

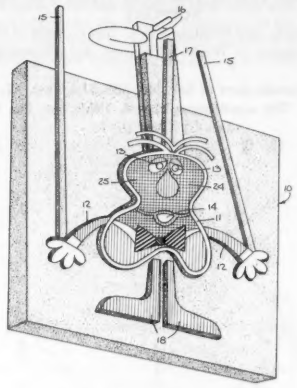
Morey Bunin, New York, N.Y., assignor to Aniforms, Inc., New York, N.Y.

Filed Jan. 20, 1975, Ser. No. 542,451

Int. Cl.[2] A63H *7/00;* **G03B** *19/18*

U.S. Cl. 46—126 **4 Claims**

1. In apparatus for continuous production of movingline type animated characterizations for use in television or moving picture techniques of the type wherein the apparatus comprises in combination at least one essentially two-dimensional open outline primary form fabricated from readily deformable material in the shape of an outline of an object, and at least one secondary two-dimensional form fabricated in the shape of a feature of said object, and means connected to each primary and secondary form for manipulation of the same, the improvement which comprises covering the under-



side of the area defined by said primary form with an opaque, flexible material normally showing as a black color on television.

3,899,849

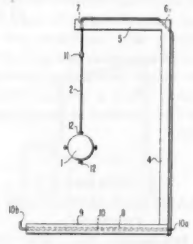
REMOTE-CONTROL DEVICE FOR SPINNING TOPS

John D. Witiak, 8648 Piney Branch Rd., Silver Spring, Md. 10901

Filed May 16, 1973, Ser. No. 360,798

Int. Cl. A63h *27/12, 33/26*

U.S. Cl. 46—241 **13 Claims**



1. A device for remotely controlling one or more spinning tops, including at least one spinning top, having at least a portion thereof fabricated from a paramagnetic material, a drawstring secured at one end thereof to said spinning top to permit winding of said top on said drawstring, remote control means for actuating one or more of said tops, magnetic means cooperating with said paramagnetic portion for selectively engaging said spinning top, the improvement comprising: a support means for mounting one or more spinning tops including, a base member, a vertical support member having one end thereof fixed to said base member; a horizontal support member, spaced from and disposed in parallel relationship to said base member, said horizontal support member having one end thereof fixed to the other end of said vertical support member; a first bore disposed in said horizontal support member extending substantially perpendicular to said base member at an end remote from said vertical support member; passage means provided in said horizontal support member and said vertical support member, said passage means being angularly disposed with respect to said horizontal support member and said vertical support member; and a second bore provided in said base member extending substantially parallel to said horizontal support member, said drawstring passing through at least one

of said bores and said passage means and said remote control means being operable through at least one of said bores whereby said one or more spinning tops may be selectively operated.

3,899,850

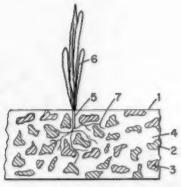
CARRIER BODIES FOR PLANTS

Maternus Glück, Linz-Hart; Bernhard Eder, and Walter Kriegner, both of Linz, all of Austria, assignors to Semperit AG, Vienna, Austria

Continuation-in-part of Ser. No. 166,831, July 28, 1971, abandoned. This application Apr. 8, 1974, Ser. No. 459,066

Int. Cl.[2] A01G *9/10*

U.S. Cl. 47—37 **18 Claims**



1. A carrier body for a plant, comprising a mixture of foam flakes and nutritives, said foam flakes embodying foam flakes including at least 80% open pores, a foam binder of open cell configuration for binding together said foam flakes and nutritives to form a foamed body, said foam binder being water insoluble, said foamed body possessing a density value of between 60 and 200 kg per m^3.

3,899,851

MACHINES FOR EDGE-TRIMMING AND BEVELLING SPECTACLE LENSES

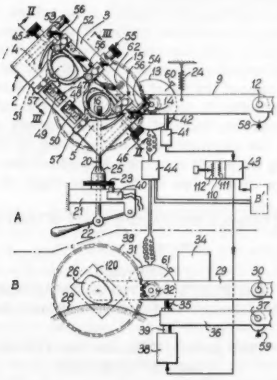
Robert Raymond Maurice Asselin, 10, rue Magenta, and Pierre Henri Léon Asselin, 61, rue Poussin, both of Elbenf, France

Filed June 25, 1973, Ser. No. 372,996

Claims priority, application France, June 28, 1972, 72.23305; May 9, 1973, 73.16695

Int. Cl.[2] B24B *9/14*

U.S. Cl. 51—101 LG **31 Claims**



1. Apparatus for bevelling the edges of a lens in conformance with a predetermined bezel contour comprising a support for holding a member having a bezel contour, means for rotating said bezel support about an axis perpendicular to the mean plane of the bezel member, means for following the contour of said bezel member to sense the shape thereof, a grinding machine having a grinding wheel, a support for holding a lens, means for rotating said lens support, each of the bezel member support and lens support being carried on an individually pivotable arm, said means for rotating the corresponding support being mounted on the respective arm and means for copying the shape of said bezel on said lens comprising means interconnecting said means for rotating said lens support and said means for rotating said bezel support rotating said lens synchronously with the rotation of said bezel member, means for simultaneously moving said lens support and said grinding wheel relatively toward each other in response to the sensing of the shape of said contour to cause said grinding wheel to grind said lens into the shape of said bezel and means for controlling the relative pressure between said lens and said grinding wheel independently of the means for following said bezel.

3,899,852

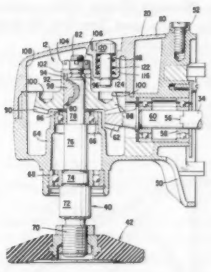
SPINDLE DRIVE ASSEMBLY FOR A SURFACE-TREATING MACHINE

William A. Batson, Pickens, S.C., assignor to The Singer Company, New York, N.Y.

Filed Aug. 23, 1974, Ser. No. 499,814

Int. Cl.[2] B24B *23/00*; **G05G** *5/06*

U.S. Cl. 51—170 T **7 Claims**



1. A spindle drive assembly for a surface-treating machine driven by a portable electric motor mounted in a housing and having a drive pinion engaging said assembly, said assembly comprising:

a. a spindle journaled in the housing perpendicular to the drive pinion,

b. a driven gear affixed to the spindle in superposition to and in operative engagement with the drive pinion,

c. face apertures formed on the side of the driven gear opposite the drive pinion,

d. a pin carried by the housing for engaging any one of the face apertures,

e. means connected to the pin to normally bias the pin in the direction away from the face apertures, and

f. manually operated means formed on the pin for operator actuation in overcoming the bias means to urge the pin to engage one of the face apertures to lock the driven gear and the spindle against rotation.

3,899,853

TENT STRUCTURE

Charles D. Wertman, Kirkland Lake, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 8, 1974, Ser. No. 458,662

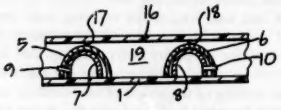
Int. Cl.[2] E04B *1/34*; **E04G** *11/04*

U.S. Cl. 52—2 **2 Claims**

1. A tent structure, comprising

a first sheet of material functioning as a tent cover, said sheet having a plurality of spaced substantially parallel pockets formed on one surface thereof;

a plurality of independently inflatable tubes, each housed in a corresponding one of the pockets of the sheet and each having a valve device selectively inflating and deflating it whereby in inflated condition the tubes stand upright as



a plurality of substantially parallel arches supporting the sheet therein; and

a second sheet of material functioning as a tent cover and fastening means on the second sheet and on pockets formed in the first sheet for removably fastening the second sheet on the outside of the arches with an air space determined by the thickness of the inflated tubes between the first and second sheets.

3,899,854

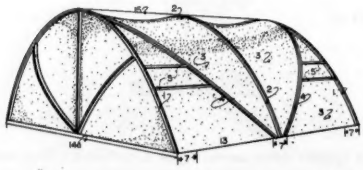
METHOD OF ERECTION FOR A PRETENSIONED MEMBRANE STRUCTURE

Carl F. Huddle, Pleasant Ridge, Mich., assignor to Jon Vredevoogd, Mason, Mich. and Tension Structures Co., Pleasant Ridge, Mich., part interest to each

Division of Ser. No. 359,892, May 14, 1973. This application Feb. 19, 1974, Ser. No. 434,077

Int. Cl.[2] E04B *1/32*

U.S. Cl. 52—80 **5 Claims**



1. In the construction of a tensioned membrane structure supported by a multiplicity of prestressed upright arches with curved bights, consecutively spaced apart and mounted on a base that includes at least one intermediate arch interposed between two upright arches, at least one shallow longitudinal arch, attached to and extending between said two upright arches that bridges at least one intermediate arch to form a vaulted frame in space, a flexible membrane operatively attached to and extending between said upright arches which has a definite concave inward curve between said arches and is tensioned longitudinally and transversely to form a roof for the structure; a method of assembly and erection of said structure that includes:

a. the assembly of said support arch members, in their flat state, on a base in a pre-erection pattern

b. attaching said membrane to said flat support arch members

c. attaching each end of a shallow longitudinal arch to a support arch member, said longitudinal arch bridging at least one intermediate support arch

d. Attaching optional safety tension members between support arch members

e. Moving the opposite ends of the support arch members towards each other thus causing the prestressed support arches to be formed by bowing them from their flat position which raises the structure to a selected position

f. Adjusting membrane tensions by moving the arches horizontally

g. Securing the structure to the supporting base

h. Installing optional tension members between the opposite ends of said support arches.

3,899,855

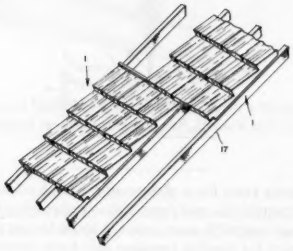
PEAKED ROOF STRUCTURE OF POLYURETHANE MOLDED BUILDING PANELS WITH INTEGRAL, BONDED, LOW-DENSITY URETHANE INSULATION BACKING

William Gadsby, Seattle, Wash., assignor to Nathaniel G. Kanrich, Seattle, Wash.

Continuation-in-part of Ser. No. 225,548, Feb. 11, 1972, abandoned. This application May 25, 1973, Ser. No. 364,089

Int. Cl. E04b *7/02*

U.S. Cl. 52—90 **4 Claims**



1. A roof structure comprising:

spaced rafters extending from the peak of the roof,

rows of side-by-side, prefabricated, durable, fire-retardant building panels bridging the gaps between the rafters and secured thereto, each roof panel comprising a unitary, variable-density, closed-cell, polyurethane foam panel having an outer, variegated skin surface resembling a hand-split shake roof of natural wood with a density from 25 to 60 pounds per cubic foot and an inner, integral, insulating, low-density, polyurethane foam with a density ranging 4 to 12 pounds per cubic foot, an ultra-violet stabilized sealant coating over the exterior surface of each panel, a continuous recessed portion along the lower edge of each panel extending the entire length of the lower edge for mating and keying with the upper edge of an abutting roof panel,

means for securing the panels to the rafters, such means including (1) clips cast into each of the upper corners of each panel, each clip provided with an inwardly extending slot and tab portion extending beyond the terminating upper edge of the panel through which means are driven into the rafter to secure the panel to the rafter, and (2) clips cast into each of the lower corners of the panel within the recessed portion, each clip having a tab extending outwardly into the recessed portion mating with the slot of the clips in the upper edges of an abutting panel, and

a sealant between the abutting edges of each panel.

3,899,856

PROPERTY BOUNDARY MARKER

John David Johnson, 1435 3rd Ave. South, Anoka, Minn. 55303

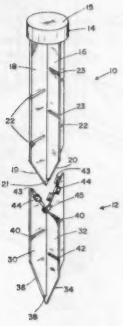
Filed June 3, 1974, Ser. No. 475,746

Int. Cl.[2] E04F *9/02*

U.S. Cl. 52—98 **8 Claims**

1. A property boundary marker adapted to be driven into the ground comprising a main column with a driving head at one end and a point at the other end, said main column being formed from at least two generally planar members intersect-

ing each other generally along the axis of said main column, which axis extends from said head to said point, and at least one secondary column also formed from intersecting planar members and having a point at one end and interlocking means at the other end, said interlocking means comprising tabs extending from the ends of some of the planar members



of the secondary column generally along said axis so as to lay alongside the planar members of said main column adapted to receive the point of said main column therein with the planar members of the main column generally in alignment with the planar members of said secondary column, at least one of said secondary column planar members being cut in at an angle to receive the pointed end of the other column.

3,899,857

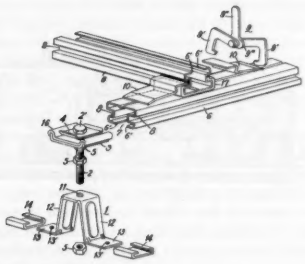
FRAMING ELEMENT AND ITS SUPPORTING DEVICE FOR LAYING INTERIOR BOARDING ON FOUNDATION STRUCTURE

Mitsuo Mochizuki, 3-chome, Higashi-Osaka, Japan

Filed Dec. 12, 1973, Ser. No. 424,077

Int. Cl.[2] E04F *15/024*

U.S. Cl. 52—126 **9 Claims**



1. A supporting device comprising a metal supporting stand having an upper end provided with a central hole and a leg portions having ground-contacting plates for attachment to a slab surface, a framing element provided with a longitudinal under-groove on its under-side and supported by the stand at a desired height above the slab's surface, an adjusting bolt accommodated in the central hole of the upper end and rigidly fixed to the stand, supporting the framing element by means of a set of nuts contacting said upper end about said central hole from both above and below, another nut member disposed on said bolt fastening the under-side of said framing element between the head end of said bolt, which is accommodated in the under-groove of the framing element, and a supporting plate disposed on said bolt underneath said bolt head, and said supporting plate coacting with the framing element to support the framing element from below.

3,899,858

WINDOW

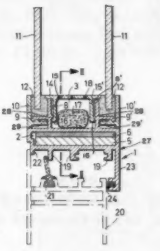
Paul Zanker, Tubingen, Germany, assignor to Saint-Gobain Industries, France

Filed Oct. 23, 1973, Ser. No. 409,015

Claims priority, application Germany, Oct. 21, 1972, 2251790

Int. Cl. E06b *3/24*

U.S. Cl. 52—172 **5 Claims**



1. A moveable double-glazed window including a frame comprising, along each side of the window, a plurality of linear elements assembled together into a frame side member defining

a. inner and outer tubular channels,

b. at least two flanges extending from the exterior of said inner channel for the reception on each of a fillet of mastic, and

c. at least one flange extending from the exterior of said outer channel for engagement with a stationary window casing,

said frame comprising, at the corners thereof where adjacent of said frame side members intersect, fastening means engaging the outer channels of said intersecting frame side members, said window further comprising absorbent means disposed in the inner tubular channel of at least one of the said frame side members, and two panes each having its edges embedded in one of said fillets, the inner tubular channel of at least one frame side member being apertured to the space between said panes.

3,899,859

SKIRTING BOARDS AND FACIA COVERS THEREFOR

Ronald Smith, 73 Hampton Road, Manchester, Lancaster, England

Filed Mar. 4, 1974, Ser. No. 447,641

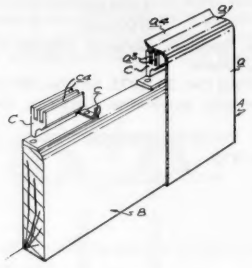
Claims priority, application United Kingdom, May 18, 1973, 23864/73

Int. Cl.[2] E04F *19/04*

U.S. Cl. 52—287 **6 Claims**

1. Means for the detachable covering of an existing skirting board extending along the wall of a room at the floor and having a top extending away from the wall comprising a facia cover and means for mounting said cover on the board, said cover comprising a vertical portion adapted for extending upward from adjacent the floor and having an integral upper end portion adapted for extending over said top portion of the board to the wall, said upper end portion having a longitudinal resilient edge for engaging the wall with a substantially dust tight fit, and a plurality of integral longitudinal internal ribs on said cover projecting toward said board, and said mounting means comprising a plurality of brackets adapted to be secured upon said top portion of the board, each of said brack-

ets having a pluralaity of longitudinal slots adapted to receive in interfitting relation the ribs on said cover, and said brackets



comprising the sole connections between said cover and the skirting board.

3,899,860

ENTRANCE DOOR AND METHOD OF CONSTRUCTION

Norman M. Newell, 14508 Carmenita Rd., Norwalk, Calif. 90650

Filed July 10, 1974, Ser. No. 487,170
Int. Cl. B32b *21/14*
U.S. Cl. 52—313 **6 Claims**

1. A method of constructing a door with paneling on the surface thereof, including the steps of

cutting a thin sheet of hardboard having a grain structure embossed on the upper surface thereof to provide a plurality of panel members,

laying said panel members down side-by-side on a flat working surface to form a rectangular composite sheet of paneling with the adjacent panel members in at least the central section of the composite sheet grouped and arranged in patterns of diverse grain direction,

laying strips of adhesive tape along the cracks of adjacent panel members to hold them together,

applying glue to a surface of an understructure for the door, placing said composite sheet of paneling on said surface of the understructure,

pressing said composite sheet of paneling and understructure together until the glue dries, and

forming grooves along the horizontal and vertical side edges of said plurality of panel members in at least the central section of the composite sheet.

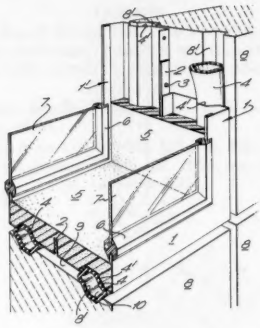
3,899,861

SOUND INSULATING WINDOW

R. G. Brown, London, England, assignor to The Council of the London Borough of Hounslow, London, England

Filed Feb. 4, 1974, Ser. No. 439,547
Claims priority, application United Kingdom, Feb. 3, 1973, 5473/73
Int. Cl.[2] E04B *2/28;* **E06B** *1/18*
U.S. Cl. 52—616 **8 Claims**

1. A sound insulating window structure comprising two frame members constructed from sheet material, each frame member in transverse cross-section being of a generally U-shaped configuration defined by a pair of flanges joined by a web, said frame members being positioned in coextensive side-by-side relationship with a first flange of each frame member being adjacent each other and a second flange of each frame member being remote from each other, said first flanges being disposed between said second flanges, resilient sound insulating means located between said first flanges, means connecting said two frame members in their coextensive side-by-side relationship, a peripheral outwardly opening recess formed in each of said webs bounding the respective frame members, sound insulating material located within said U-shaped frame members, a resilient glazing strip peripherally extending about and secured to said second flanges, glazing material secured by said resilient glazing strips to each of said



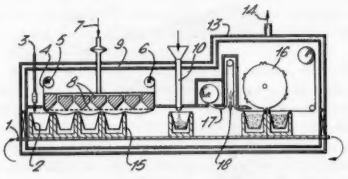
frame members, and flexible gasket means received in each of said recesses and extending about the periphery of said frame members for supporting the latter in an associated window opening.

3,899,862

STERILIZATION OF CONTAINERS

Gerard Tuynenburg Muys, Rotterdam; Hubertus Leonardus Maria Lelieveld, Maassluis, and Robert van der Hulst, Vlaardingen, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 131,626, April 6, 1971, abandoned. This application June 12, 1973, Ser. No. 369,348
Int. Cl. B65b *55/10*
U.S. Cl. 53—21 FC **12 Claims**



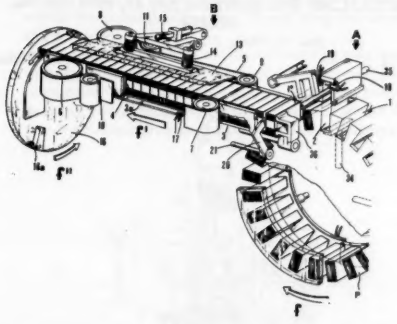
10. A process for continuously sterilising, aseptically filling and closing containers in a low moisture environment maintained at substantially ambient conditions comprising the steps of placing the containers on a moving conveyor; moving the containers past a sterilising agent dosing device; dosing the containers with a sterilising agent which does not substantially increase the temperature of the container; temporarily sealing the container; retaining the sterilising agent in the container for a time sufficient for sterilisation to take place; moving the containers into a sterile tunnel within which a gaseous environment is maintained at slight over pressure; removing the temporary seal; filling the container; applying a sterile lid to the container; and moving the closed container out of the tunnel.

3,899,863

APPARATUS FOR THE EXITING OF PRODUCTS, PARTICULARLY PACKETS OF CIGARETTES AND SIMILAR, FROM A WRAPPING PACKING LINE FOR THE SAID PRODUCTS

Ariosto Seragnoli, deceased, late of Bologna, Italy, and by Elazar Romano, legal representative, Bologna, Italy, assignors to G. D. Societa in Accomandita Semplice di Enzo Seragnoli e Ariosto Seragnoli, Italy

Filed Dec. 10, 1973, Ser. No. 423,180
Claims priority, application Italy, Mar. 5, 1973, 3345/73
Int. Cl. B65b *57/00*
U.S. Cl. 53—53 **5 Claims**



1. Apparatus for controlled exiting of packaged products from an intermittently operable packaging machine, comprising:

channel means for receiving packaged products, one at a time, from an intermittently operable packaging machine and for providing a flow path for such products, the channel means having mutually opposite ends providing respectively an entry portion and an exit portion of the flow path; transporting means for effecting intermittent transporting of packaged products onto and along the channel means, toward the exit portion;

retainer means disposed adjacent to and upstream of said entry portion; means for effecting intermittent moving of the retainer means between a first position thereof, in which the retainer means is enabled to close said entry portion and to retain the received packaged products, and a second position of the retainer means, in which — pursuant to said transporting of products by the transporting means — a packaged product, if presented for entry is enabled to enter said entry portion;

first sensing means, disposed adjacent to and upstream of said retainer means for effecting intermittent sensing of whether or not a packaged product is presented for entry into said entry portion; second sensing means, disposed downstream of said retainer means and upstream of said exit portion for effecting intermittent sensing to test received products as to whether or not each of them has been properly packaged;

ejector means at the exit portion of the channel means; means for effecting intermittent moving of the ejector means to eject successive received products from the channel means; deviator means for selective directing of ejected products along different paths in response to the sensing of said second sensing means; control means for controlling the selective directing of ejected products by the deviator means in response to the sensing of the second sensing means;

means for synchronizing the intermittent transporting, moving, controlling and sensing, with intermittent operations of the machine for packaging products; and means for interrupting the synchronized intermittent transporting and moving and the synchronized intermittent sensing of the second sensing means, in response to sensing by the first sensing means that a packaged product is not presented for entry, and until said first sensing means senses that a packaged product is presented for entry;

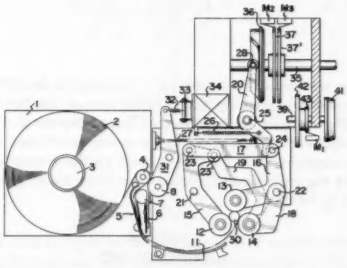
whereby the apparatus effects selective exiting of properly packaged products along one path, and of other products along a different path, whenever a packaged product is presented to enter the entry portion of the channel means.

3,899,864

COIN WRAPPING APPARATUS

Isamu Uchida, Tokyo; Kenkichi Watanabe, Kawasaki, and Hideshi Sentoku, Tokyo, all of Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1973, Ser. No. 423,518
Claims priority, application Japan, Dec. 15, 1972, 47-12602
Int. Cl. B65b *11/04*
U.S. Cl. 53—212 **11 Claims**



10. A coin wrapping apparatus comprising a coin wrapping station adapted to receive and support a cylindrical stack of coins therein; and

means at said wrapping station for selectively guiding and wrapping a coin wrapping tape about a stack of coins at the station;

said wrapping means including:

three wrapping rolls respectively located in a predetermined array at the vertexes of an equilateral triangle;

two connecting levers, each having one of said wrapping rolls mounted at one end thereof and each being pivotally mounted in said apparatus at their mid-portion of fixed pivot points;

a connecting rod having opposite ends pivotally connected to the ends of said connecting levers remote from said one ends thereof, said connecting rod and said connecting levers being disposed with respect to each other such that the opposite ends of said connecting rod and said fixed pivot points always are located at the corners of a parallelogram;

a first arm having the other of said wrapping rolls mounted at one end thereof and pivotally mounted at its other end on one of said first pivot points;

a second arm, said other of said wrapping rolls also being mounted, at one end of said second arm, and said second arm being pivotably connected to said remote end of one of said levers.

3,899,865

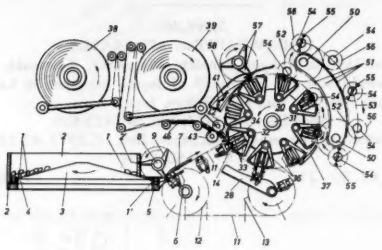
WRAPPING APPARATUS

Leon Revaz, Bienne, Switzerland, assignor to Otto Hansel GmbH, Hannover, Germany

Filed Oct. 3, 1973, Ser. No. 403,336
Int. Cl.² B65B *11/34*
U.S. Cl. 53—234 **13 Claims**

1. Apparatus for continuously wrapping sweets or like small objects, said apparatus comprising a continuously revolving wrapping head carrying a plurality of gripping and folding

devices positioned about its circumference, a feed conveyor carrying a plurality of sweet carrying devices for feeding sweets consecutively to the wrapping head, feed means for feeding wrappers to the wrapping head, means for guiding the feed conveyor from a sweet receiving station towards the wrapping head and then around part of the circumference of the wrapping head where the feed conveyor travels in synchronism with the wrapping head and where each sweet carried by a sweet carrying device is transferred therefrom to a corresponding gripping and folding device for holding and partially wrapping each sweet transferred thereto in a wrapper from the feed means, and closure means positioned adjacent to the wrapping head for closing each partially wrapped sweet held by the gripping and folding devices on the wrapping head within its wrapper.

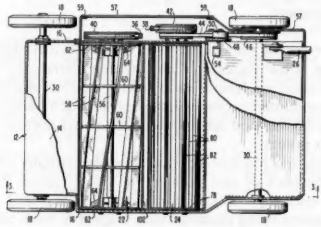


3,899,866

LAWN MOWER

Werner Adolph Klier, 200 E. Bonner, San Antonio, Tex. 78214

Filed June 6, 1974, Ser. No. 477,474
Int. Cl. A01d *35/24*
U.S. Cl. 56—13.8 **12 Claims**



1. A lawn mower comprising:

a housing supported by a plurality of wheels, said housing having a top wall and depending side walls,

power means mounted on said top wall of said housing,

reel-type cutting means disposed within said housing, said cutting means extending substantially transversely to the direction of travel of said mower and being rotatably mounted on opposite side walls of said housing,

shredder means disposed within said housing rearwardly of said cutting means, said shredder means being rotatably mounted on opposite side walls of said housing and having vane means for creating a rearward air flow during rotation of said shredder means,

means for drivingly connecting said cutting means and said shredder means to said power means,

subhousing means mounted within said housing and substantially enclosing said cutting means and said shredder means, and

discharge means mounted within said housing for guiding shredded grass cuttings rearwardly from said shredder member to the exterior of said housing,

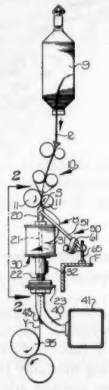
whereby rotation of said cutting means and said shredder means serves to create a rearward air flow in said subhousing means to lift grass for uniform cutting by said cutting means and to move the grass cuttings rearwardly to said shredder means and then rearwardly through said discharge means.

3,899,867

METHOD AND APPARATUS FOR FORMING HELICALLY WRAPPED YARNS

Francis B. Northup, and Donald R. Hart, both of Sanford, N.C., assignors to Spanco Yarns, Inc., Sanford, N.C.

Continuation-in-part of Ser. No. 279,944, Aug. 11, 1972, Pat. No. 3,831,369. This application July 15, 1974, Ser. No. 488,810
Int. Cl. D02g *3/28;* **D01h** *7/18*
U.S. Cl. 57—18 **20 Claims**



10. In a machine for making a higher quality wrapped yarn from a core strand and a binder strand, said machine comprising a hollow spindle having a package of binder strand mounted for rotation thereon and adapted to be wrapped around the core strand as the core strand is moving into one end of and through the hollow spindle and wherein the binder strand inherently balloons outwardly in its path of travel from the package to the core strand being wrapped, the combination therewith of means positioned in the path of travel of the ballooning binder strand for intermittently and repeatedly interrupting the path of travel of the ballooning binder strand and imparting an undulating movement thereto to cause fiber waste picked up by the binder strand to be cast off the same and to thus improve the quality of the wrapped yarn being formed.

3,899,868

CONTROL ARRANGEMENT FOR YARN PIECING APPARATUS

Charles D. Lee, Jr., and William L. Mulligan, both of Charlotte, N.C., assignors to Parks-Cramer Company, Fitchburg, Mass.

Filed July 17, 1974, Ser. No. 489,432
Int. Cl. D01h *15/00*
U.S. Cl. 57—34 R **7 Claims**

1. In combination with

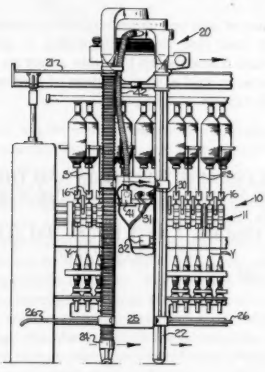
a textile yarn forming machine having a plurality of drafting systems arranged at a series of locations for normally receiving a corresponding series of supply strands and normally delivering a corresponding series of attenuated strands and a plurality of stop members, each mounted adjacent a corresponding one of said drafting systems and selectively actuable for movement between a retracted

position spaced from a corresponding supply strand and a strand interrupting position engaging and restraining the corresponding supply strand and thereby for interrupting passage of the restrained supply strand into the corresponding drafting system, and

a traveling unit traversing the machine and having instrumentalities for reinstituting attenuated strand formation at a drafting system where an attenuated strand is absent, an arrangement for facilitating reduction in the number of ineffective attempts at reinstitution of strand formation and comprising:

active sonic detector means mounted on said traveling unit for movement therewith along said machine and for electrically signaling traversal of a drafting system location at which the corresponding one of said stop members is in the retracted position,

attenuated strand detector means mounted on said traveling unit for movement therewith along said machine and responsive to electrostatic charges normally present at drafting system locations during attenuated strand formation for electrically signaling traversal of a drafting system



location at which normal attenuated strand formation is occurring,

logic circuit means electricallly connected with said sonic detector means and said strand detector means for distinguishing among signaled traversal of a location at which said corresponding member is in the retracted position and strand formation is occurring, signaled traversal of a location at which said corresponding member is in the retracted position and strand formation has been interrupted, and traversal of a location at which said corresponding member is in the strand interrupting position, and

control means for responding to said logic circuit means distinguishing signaled traversal of a location at which said corresponding member is retracted and strand formation has been interrupted by stopping traversal of said machine by said traveling unit and initiating operation of said instrumentalities for reinstituting attenuated strand formation and for responding to said logic circuit distinguishing either of the other traversals by continuing traversal of said machine by said traveling unit.

3,899,869

SHANK HEAD FOR DROP SPINDLE

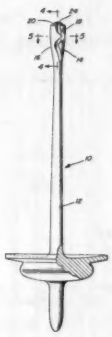
Walter C. Easton, Route No. 1, Oakland, Maine 04763

Filed Mar. 11, 1974, Ser. No. 450,044

Int. Cl.[2] D01H *7/04*

U.S. Cl. 57—37 **3 Claims**

1. In combination with a drop spindle including opposite ends, one end of said spindle including a shank portion having a gradually flaring head on one end, said head including a generally straight central passage formed therein extending longitudinally of said spindle and opening endwise outwardly at one end through said one end of said spindle, the other end of said passage curving slightly outwardly and opening through one side of said spindle at the minor diameter end of said head, and a longitudinal slot formed in said head communicating the full length of said passage with the external sur-



faces of said head on said one side of said spindle, said slot opening through said one side of said spindle along a sine wave path extending longitudinally of said head, said slot, at any point therealong, opening inwardly along a straight generally radial path into said passage, said sine wave path including alternate centerline crests spaced circumferentially about said one side of said head a distance greater than the width of said slot.

3,899,870

SPOOL CHANGING DEVICE FOR SPINNING MACHINES

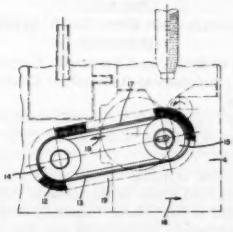
Siegfried Roller, Fellbach, and Gustav Idler, Strumpfelbach, both of Germany, assignors to C. Eugen Maier Metalverarbeitung GmbH, Fellbach, Germany

Filed Dec. 3, 1973, Ser. No. 421,218

Claims priority, application Germany, Dec. 29, 1972, 2263933

Int. Cl. D01h *9/10, 15/00*

U.S. Cl. 57—53 **8 Claims**



1. A package-changing apparatus for spinning and twisting machines in which packages in the form of a fully wound yarn tube are removed from a spindle and a fresh yarn tube placed on the spindle, the apparatus comprising movable support means arranged to move past the spindle, cutting means located on said movable support means and retaining means movably mounted on the movable support means in a position

located between the cutting means and the spindle so that upon removal of a package from the spindle the end of the yarn on the package is held by the retaining means prior to the cutting of the yarn, and after cutting of the yarn turns of yarn formed on the spindle are held in position thereon by the retaining means until a new yarn tube is placed on the spindle.

3,899,871

CLOCK WITH DIAL ILLUMINATION

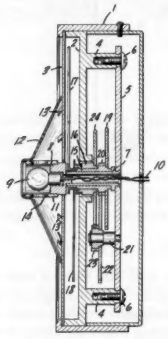
Kiyoshi Kitai, Tokyo, Japan, assignor to Seiko Koki Kabushiki Kaisha, Japan

Filed May 7, 1974, Ser. No. 467,748

Claims priority, application Japan, May 9, 1973, 48-53570; May 9, 1973, 48-53571

Int. Cl. G04b *19/30*

U.S. Cl. 58—50 R **4 Claims**



1. A clock comprising, a case, a dial internally thereof having time indicia on a face thereof, a tubular element coaxial with the dial and extending axially rearwardly of the backside of the dial, an electric bulb socket mounted coaxial with said tubular element forwardly of the face of the dial for receiving an electric bulb therein, electrical lead connections to said socket extending through said tubular element to said socket and out of a rear end of said tubular element, a reflector spaced from said socket and having inner surfaces for reflecting light from said bulb rearwardly of the reflector onto said face of the dial and over said time indicia, means mounting said reflector, said reflector comprising angularly spaced peripheral notches on the base thereof for passing rays of light in registry with a corresponding time indicium.

3,899,872

DIGITAL TIMER AND TIME INDICATOR DRUMS THEREFOR

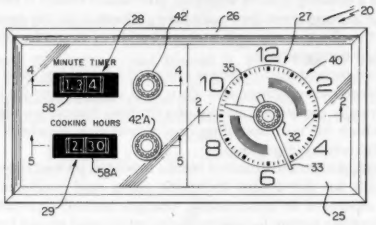
Paul T. Flumm, Oakville, and Vernon B. Harris, Waterbury, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 30, 1974, Ser. No. 465,707

Int. Cl. G04f *3/06*; **G04b** *19/02*

U.S. Cl. 58—125 C **9 Claims**

1. In combination, a frame means, shaft means carried by said frame means, and a pair of digital time indicating drums rotatably mounted to said frame means by said shaft means, said drums having means cooperating together so that one of said drums will cause incremental movement of the other drum in a timed relation to incremental movement of said one drum, said cooperating means comprising a pinion-like gear means rotatably mounted to said frame means intermediate said drums, said one drum having drive means operatively associated with said gear means to drive the same as said one drum is rotated, said other drum having driven means operatively associated with said gear means to be driven thereby in a timed relation to the incremental movement of said one drum, said one drum having driven means to be driven by drive means when interconnected thereto, said driven means of said one drum comprising a plurality of pins extending in a circular array from said one drum substantially parallel to the



axis of rotation of said one drum, said drive means that drives said pins of said one drum comprising a gear rotatably mounted to said frame means to rotate about an axis substantially transverse to said axis of rotation of said one drum and meshing with certain of said pins.

3,899,873

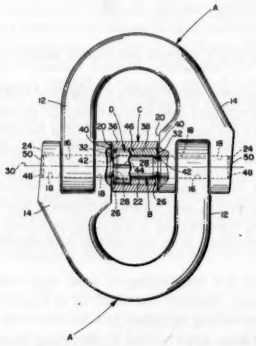
COUPLING LINK FOR CHAIN AND THE LIKE

Richard H. Fink, York, Pa., assignor to Campbell Chain Company, York, Pa.

Filed Jan. 7, 1974, Ser. No. 431,214

Int. Cl. F16g *13/06*

U.S. Cl. 59—85 **6 Claims**

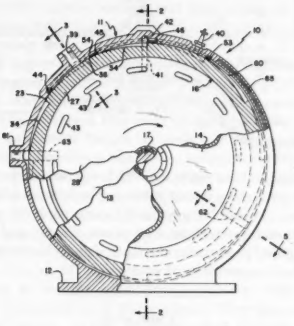


1. A coupling link for joining chains or the like comprising two U-shape half links having interdigitated ends with aligned holes therethrough, a pin extending through said holes for hingedly joining the half links, said pin having two axially spaced grooves intermediate its ends, and a retaining means interposed between and being substantially axially coextensive with the interconnected link ends, said retaining means having a hollow body portion of greater outer diameter than the diameter of the holes through the link ends and having radially inwardly bent arcuate spring members at opposite ends of said body portion, said spring members being selectively resiliently received in said spaced grooves to hold said pin in a predetermined axial position.

3,899,874
TURBINE ENGINE

Henry E. Bailey, P.O. Box 350, Walnut Creek, Calif. 94579; Dennis H. Bailey, and Richard E. Bailey, both of P.O. Box AL, Clearlake Highlands, Calif. 95422

Filed Sept. 11, 1974, Ser. No. 505,053
Int. Cl.[2] F02C 5/04
U.S. Cl. 60—39.34 8 Claims



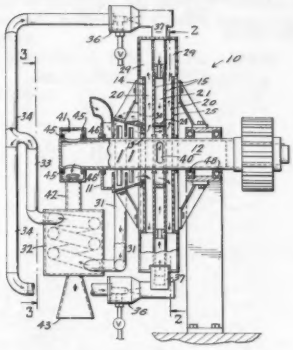
1. A turbine engine comprising the combination of a housing, a rotor mounted for rotation within the housing, said rotor being formed about its outer periphery with a plurality of circumferentially spaced recesses which define with the housing combustible charge chambers and air chambers with the charge chambers alternating with the air chambers, means forming a compression chamber within the rotor, air compression means driven by the rotor for directing air under pressure into the compression chamber, first passage means for communicating compressed air from the compression chamber to the recesses, inlet means for directing a combustible charge into the charge chambers, means for igniting the combustible charge in each charge chamber whereby the charge undergoes constant volume combustion in the charge chambers, means on the housing for sealing the charge chambers during combustion, means forming an expansion channel on the inner periphery of the housing extending from past the sealing means in the direction of rotation of the rotor so that upon communication of the charge chambers with the expansion channel, the combustion gases expand into the expansion channel and impinge on the surfaces of the rotor recesses to thereby impart torque to the rotor, and outlet means in the housing for exhausting spent gases from the expansion channel.

3,899,875
GAS REGENERATION TESLA-TYPE TURBINE

Robert A. Oklejas, and Eli Oklejas, Jr., both of 3311 Lakeview Dr., Baycrest Beach, Monroe, Mich. 48161

Filed Jan. 16, 1974, Ser. No. 433,672
Int. Cl. F02c 7/10, 7/12
U.S. Cl. 60—39.51 R 13 Claims

9. A turbine comprising a casing and a rotor within said casing, said rotor comprising a rotatable shaft and blades connected circumferentially to said shaft, said blades defining first and second pluralities of alternating spaces therebetween, said first plurality of alternate spaces having means for generally centrally receiving a low temperature cooling fluid and said second plurality of alternate spaces having means for peripherally receiving a high temperature working fluid, means on said casing for peripherally collecting the cooling fluid from said first plurality of spaces, means on said rotor for exhausting the working fluid from said second plurality of spaces, and means on said casing and on said rotor for isolating said first plurality of spaces from said second plurality of spaces whereby each of said blades receiving the working fluid across one side thereof correspondingly receives a cooling

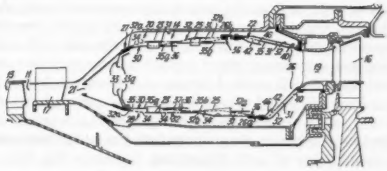


fluid, in substantially counterflow relationship, across an opposite side thereof.

3,899,876
FLAME TUBE FOR A GAS TURBINE COMBUSTION EQUIPMENT

Douglas H. Williamson, Derby, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 13, 1969, Ser. No. 876,504
Claims priority, application United Kingdom, Nov. 15, 1968, 54398/68
Int. Cl. F02c 7/18; F23r 1/10
U.S. Cl. 60—39.66 14 Claims



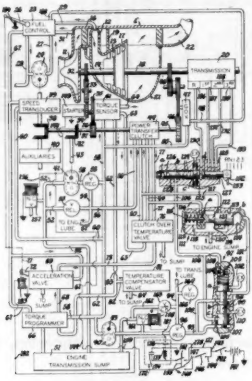
1. A flame tube for gas turbine combustion equipment, the flame tube including at least one wall of double-skinned construction having internal and external skins throughout the major part of its longitudinal and peripheral extent, the internal skin comprising a plurality of axially consecutive peripherally extending sections, means attaching each section by its upstream end only to the external skin, each section being spaced from the external skin to define respective passages therebetween, each section except the most downstream section extending downstream to the upstream end of the next section, the external skin having apertures therein, said apertures directing jets of cooling air onto the internal skin sections for impingement cooling thereof, the passages accommodating a flow of said cooling air which has cooled the internal skin sections.

3,899,877

GAS TURBINE ENGINE POWER SHIFT TRANSMISSION POWER TRAIN

Eugene E. Flanigan, Carmel; Quinton L. Heintzelman, Indianapolis, and James M. Ricketts, Oxford, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 2, 1973, Ser. No. 375,917
Int. Cl. F02c *7/26*
U.S. Cl. 60—39.14 **24 Claims**



1. A power train comprising in combination; a power plant having fuel feed means, fuel feed control means for varying power plant power, combustion apparatus, power generating means including power turbine means and power plant control means controlling the power generating means of said power plant to provide increased power for increasing output power in an output power range; a power shift transmission having an input operatively connected to said power turbine means, a load output, a plurality of fluid operated drive establishing devices for establishing and maintaining established a plurality of ratio drives between said input and output; source means providing a source of fluid under pressure driven by said power plant and connected to said power plant control means; shift control means operatively connected to said source means and said fluid operated drive establishing devices and operative to selectively control the connection of said source means to said devices for selectively maintaining the drives established and selectively providing a disconnect condition; overcontrol means operatively connected to said shift control means and said power plant control means operative in response to said shift control means maintaining a drive established controlling said power plant control means for controlling said power plant for transmitting normal power under the control of said power plant control means and in response to the establishing of said disconnect condition by said shift control means overcontrolling said power plant control means to reduce power plant power.

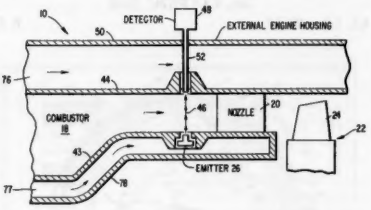
3,899,878

APPARATUS FOR INDICATING GAS TEMPERATURES

William A. Compton; Thomas E. Duffy, and Manfred I. Seegall, all of San Diego, Calif., assignors to International Harvester Company, San Diego, Calif.

Continuation-in-part of Ser. No. 273,335, July 19, 1972, abandoned, which is a division of Ser. No. 88,670, Nov. 12, 1970, abandoned. This application Feb. 23, 1973, Ser. No. 335,146
Int. Cl. F02c *9/04*
U.S. Cl. 60—39.28 T **41 Claims**

1. The combination of a turbine engine including a combustor and a turbine adapted to be driven by gases generated in said combustor with apparatus for indicating the temperature of said gases, said temperature indicating apparatus comprising a beta particle source oriented to emit beta particles through said gases, whereby said particles will be attenuated at a rate varying with the density of the gases; detector means aligned with and spaced from said beta particle source for



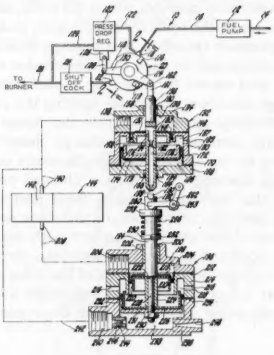
intercepting the beta particles which are not attenuated by the gases and generating an output signal indicative of the number of intercepted particles; means for measuring the pressure on said gases and generating a pressure signal; and means for converting said pressure and output signals into a signal indicative of the temperature of said gases.

3,899,879

TURBINE ENGINE FUEL CONTROL

Noel L. Downing, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 5, 1973, Ser. No. 412,748
Int. Cl. F02c *9/08*
U.S. Cl. 60—39.28 R **2 Claims**



1. A turbine engine fuel supply system comprising: a fuel metering valve having an inlet adapted to be connected to the outlet of a fuel pump and an outlet adapted to supply fuel to a burner assembly of the engine, said fuel metering valve including an orifice plate therein and a movable valve element including means thereon slidable across said orifice plate for varying flow through said orifice plate between the inlet and outlet of said valve, a shaft connected to said movable valve element, a lever connected to one end of said shaft, means for limiting arcuate movement of said lever and said valve element between minimum flow stop and maximum flow stop positions, metering valve servo means having a first axially movable stem and differential piston means therein connected to said first axially movable stem, said first differential piston means responsive to compressor discharge pressure, means including an orifice for bleeding pressure from said first differential piston means to condition said servo means to position said first axially movable stem to cause said lever to assume a maximum flow stop position where said movable valve ele-

ment is moved a fixed arcuate amount with respect to said orifice plate, valve means for closing said bleed port to condition said differential piston means to position said movable valve element toward its minimum flow stop position, a pressure ratio sensor means having second differential piston means therein selectively responsive to a regulated pressure proportional to compressor discharge pressure and an intermediate pressure of the compressor, a second axially movable stem aligned coaxially of said first stem operated by the second differential piston means and connected to said valve means, means including a power lever for biasing the second axially movable stem against the control action of said sensor means, said power lever being positioned to establish a predetermined engine thrust, said sensor means being responsive to a reduced compressor discharge pressure produced by a change in engine thrust less than that set by the power lever to position said valve means to open said servo means bleed port thereby to condition said servo means to move said movable valve element towards its maximum stop position to increase fuel supply to a burner thereby to increase engine thrust to a level as preset by the power lever, said sensor means being responsive to an increased compressor discharge pressure produced by an engine thrust above a preset power level to move said valve means to close said servo means bleed port thereby to condition said servo means to shift said movable valve element toward the minimum flow stop position to reduce fuel supply to the engine burner thereby to return engine operation to a desired thrust level as preset by said power level.

3,899,880

SEALING OF CYLINDER HEAD FOR AN INTERNAL COMBUSTION ENGINE

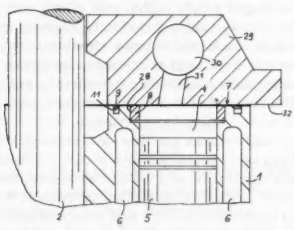
Ulrich Rohs, Roonstr. 11, D-516 Duren, Germany

Filed May 3, 1974, Ser. No. 466,716

Claims priority, application Germany, May 14, 1973, 2324322

Int. Cl. F02g *1/00;* **F02b** *57/00;* **F01b** *3/00*

U.S. Cl. 60—39.61 **8 Claims**



1. A cylinder head sealing arrangement for an internal combustion engine comprising a cylinder head, a revolving drum having a plurality of cylinder bores whose axes are parallel to each other and generally to the axis of rotation of said drum, combustion chamber means in said cylinder head with which said cylinder bores are placed in communication during the rotation of said drum, sealing means between opposing surfaces of said drum and cylinder head, said drum surface including a pair of generally annular grooves surrounding each cylinder bore, said sealing means is a sealing ring seated in each groove and bearing against the opposing surface of said cylinder head, and at least an outermost one of a first pair of sealing rings has a portion which is peripherally recessed and receives therein a portion of an outermost one of another of said pair of sealing rings.

3,899,881

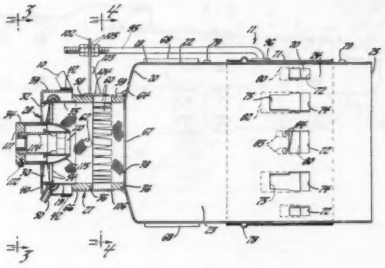
COMBUSTION APPARATUS WITH SECONDARY AIR TO VAPORIZATION CHAMBER AND CONCURRENT VARIANCE OF SECONDARY AIR AND DILUTION AIR IN A REVERSE SENSE

John R. Arvin, Indianapolis; Robert E. Sullivan; Dennis L. Troth, both of Speedway, and Albert J. Verdouw, Indianapolis, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 4, 1974, Ser. No. 439,644

Int. Cl. F02g *3/00;* **F02c** *3/00*

U.S. Cl. 60—39.65 **3 Claims**

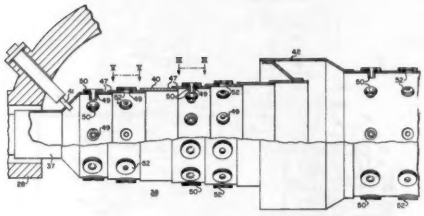


1. A combustion apparatus adapted for use in a gas turbine engine characterized by substantially complete combustion of liquid hydrocarbon fuel and by a low output of nitrogen oxides, the apparatus comprising a combustion liner having a discharge outlet for combustion products at the downstream end of the liner; the liner having an upstream end and liner wall means extending from the upstream end to the downstream end, the wall means enclosing, in sequence from the upstream end to the downstream end, a prechamber, a reaction zone, and a dilution zone; the prechamber being of significantly smaller cross-sectional area than the reaction zone and being joined to the reaction zone by an abruptly diverging wall portion; the prechamber including first air entrance means defined by swirler means at its upstream end effective to direct combustion air with a substantial transverse velocity component downstream over the inner surface of the prechamber wall means, liquid fuel introduction means downstream of the swirler means disposed to lay a film of liquid fuel on the said inner surface for evaporation by and mixture with the said combustion air, second air entrance means through the prechamber wall near the downstream end of the prechamber adapted to introduce air to dilute the fuel-air mixture, and means for varying the flow capacity of the second air entrance means; the reaction zone providing turbulent recirculating flow of burning fuel-air mixture and combustion products resulting from the swirl of the entering mixture and the abrupt divergence of the wall means; the dilution zone including dilution air entrance means to admit air for mixture with recirculating gas in the reaction zone and dilution of the combustion products flowing from the reaction zone to the discharge outlet; means for varying the flow capacity of the dilution air entrance means; and actuating means connected to both said flow capacity varying means effective to vary the flow capacity of both said air entrance means concurrently and in reverse sense; the range of variation of the entrance means being sufficient to maintain an equivalence ratio of about 0.25 to 0.5 in the fuel-air mixture flowing from the prechamber into the reaction zone throughout the normal range of operation of the combustion apparatus.

3,899,882
GAS TURBINE COMBUSTOR BASKET COOLING

Stephen R. Parker, Media, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 27, 1974, Ser. No. 455,161
Int. Cl. F02c 3/00, 7/18
U.S. Cl. 60—39.65 5 Claims

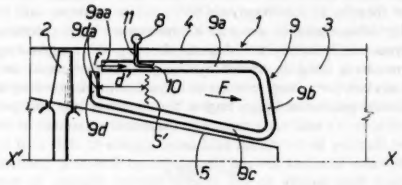


1. A combustor for a gas turbine comprising:
a generally cylindrical combustor basket;
a fuel spray nozzle disposed generally at the upstream end of said generally cylindrical combustor basket;
an ignitor member disposed near the upstream end of said generally cylindrical combustor basket;
annular arrays of air inlets comprising:
annular arrays of air scoops disposed in said generally cylindrical combustor basket;
annular arrays of air orifices disposed in said generally cylindrical combustor basket;
said air scoops being comprised of generally tubular members extending inwardly through holes in said combustor basket, said tubular members each having a generally annular flange on its radially outermost portion, said generally annular flange being disposed generally radially outwardly of the wall of said generally cylindrical combustor basket;
an intermediate generally annular spacer member disposed between said generally annular flange and said combustor basket;
said generally annular flange and said intermediate generally annular spacer member being fixedly attached to each other and said combustor basket;
said intermediate generally annular spacer member between said generally annular flange and said combustor basket having at least one arcuate gap disposed therein; said air orifices being comprised of;
a disc member having an air passage hole therethrough, said hole in said disc member being disposed generally radially outwardly of its respective adjacent hole in said combustor basket;
a second intermediate generally annular spacer member disposed between each of said disc members and said combustor basket;
said disc members and said second intermediate annular spacer members being fixedly attached to each other and said combustor basket;
said second intermediate generally annular spacer member between said disc member and said combustor basket having at least one generally arcuate gap disposed therein.

3,899,883
AFTER BURNER

Ratko Stakic, Sucy-en-Brie; Marc Francois Bernard Buisson, Le Mee-sur-Seine, and Gilbert James Rousseau, Brie-Comte-Robert, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed May 31, 1973, Ser. No. 365,402
Claims priority, application France, June 1, 1972, 72.19731
Int. Cl. F02c 7/22
U.S. Cl. 60—39.71 7 Claims



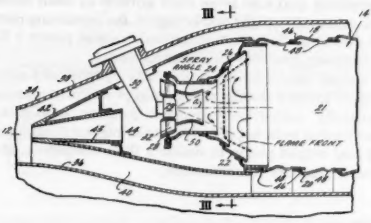
1. In and for a gas turbine engine comprising an expansion turbine discharging a high-velocity, high-temperature exhaust gas flow, an afterburner installation comprising means bounding an afterburner duct located downstream of said expansion turbine and through which duct said exhaust gas flow passes, a source of afterburner fuel, and a system for supplying the afterburner duct with afterburner fuel from said fuel source to bring about combustion of said fuel in said afterburner duct and for stabilizing said combustion, said supplying and stabilizing system consisting of a plurality of hollow tubular structures each distinct from said means bounding the afterburner duct and arranged totally within said afterburner duct, so as to be immersed in said high-velocity, high-temperature exhaust gas flow, each said tubular structure comprising four portions arranged in series relationship including:
a first entry portion extending peripherally in the longitudinal direction of the afterburner duct and having one intake orifice which faces upstream relative to the direction of said exhaust gas flow, and through which a fraction from said exhaust gas flow is collected and penetrates into the interior of said tubular structure; the interior of said entry portion being further connected, in the vicinity of said intake orifice, with said source of afterburner fuel; a second portion extending generally transversely of the longitudinal direction of the afterburner duct;
a third portion extending generally in the longitudinal direction of the afterburner duct, upstream of said second portion relative to said exhaust gas flow direction; and
a fourth discharge portion extending generally transversely of the longitudinal direction of said duct, and having a plurality of exit orifices each of which faces downstream relative to said exhaust gas flow direction; whereby, in operation, each tubular structure is traversed, along substantially its whole length extending from its first portion to its fourth portion, by a mixture of gas and fuel which is preheated by heat-transfer from the high-velocity, high-temperature exhaust gas flow in which said structure is immersed, which preheated mixture escapes in the form of a plurality of preheated jets which spontaneously ignite after entering the afterburner duct and form a stabilized flame front, without any necessity for recourse to any other film stabilizing means.

3,899,884

COMBUSTOR SYSTEMS

Edward E. Ekstedt, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 2, 1970, Ser. No. 94,289
Int. Cl. F02c 7/22
U.S. Cl. 60—39.74 R 3 Claims



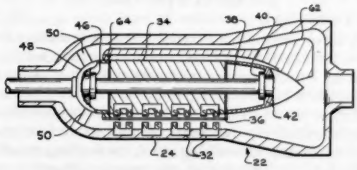
1. A combustor system comprising:
a combustion chamber,
a mixing chamber opening into the upstream end of the combustion chamber,
a spray nozzle for discharging fuel as an atomized cone into said mixing chamber, the axis of said spray cone extending lengthwise of said mixing chamber toward said combustion chamber,
means for introducing pressurized air into the upstream end of said mixing chamber and producing an axial flow field for dispersing the fuel in fine droplets,
venturi means surrounding said spray cone and through which at least a portion of the axially flowing air passes, and wherein
the air introducing means additionally provide a vortical component to the air flow field,
the venturi means comprise a venturi tube mounted within said mixing chamber,
a cylindrical conduit and an axial swirler at the upstream end of the conduit define said mixing chamber,
said air introducing means includes an annular row of generally radially oriented passageways angled through said swirler,
said axial swirler has a central opening through which the discharge end of the spray nozzle projects, and
the inlet end of the venturi tube has a diameter intermediate the minimum and maximum diameters of the annular row of swirler passageways and is bonded to said swirler.

3,899,885

ELECTRO-MAGNETIC ENERGIZER

John P. Hagerty, Prescott, Ariz., assignor to Hagerty Research and Development Co., Inc., Prescott, Ariz.

Division of Ser. No. 353,646, April 23, 1973, Pat. No. 3,821,508. This application Dec. 3, 1973, Ser. No. 420,854
Int. Cl. F02k 9/00
U.S. Cl. 60—203 1 Claim



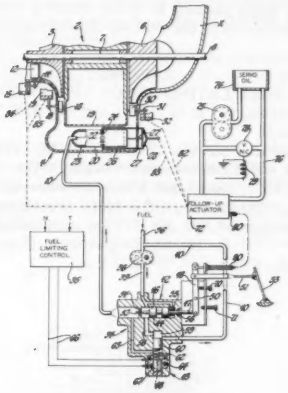
1. Apparatus for heating a fluid comprising a housing, a first plurality of magnets mounted in a pattern with a circular transverse cross section in said housing, a rotatable member with an outer circular configuration, a second plurality of magnets held by said rotatable member, means for rotating said rotatable member, a conductive member between said first and said second pluralities of magnets, means for establishing a flow of fluid past said conductive member, and a high velocity nozzle positioned downstream of said conductive member to receive the heated fluid flowing past said conductive member.

3,899,886

GAS TURBINE ENGINE CONTROL

Robert M. Swick, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 19, 1973, Ser. No. 417,257
Int. Cl. F02k 11/00; F02c 9/02
U.S. Cl. 60—223 5 Claims



1. A control system for a gas turbine engine having as controlling inputs an operator-operable power control and limiting inputs such as from engine speed responsive means and from engine temperature responsive means; the system comprising, in combination, a throttling valve for controlling fuel flow to the engine operated directly by the power control so that the flow area of the throttling valve is substantially a single-valued function of power control position, a head regulating valve controlling the pressure head across the throttling valve, and fuel limiting control means for controlling the head regulating valve normally effective to vary the said pressure head in response to such limiting inputs, the fuel limiting control means being effective to regulate the head so as not to exceed a maximum value allowable for safe engine operation as determined by the said limiting inputs, and being effective to cause the head to drop to a value insufficient to overfuel the engine with the throttling valve fully open in the event of failure of the head regulating valve controlling means.

3,899,887

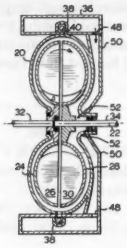
HYDRAULIC COUPLING WITH RESERVOIR

John E. Becker, Bowmanville, Canada, assignor to Cluaran Associates Ltd., Oshawa, Canada

Filed Sept. 11, 1974, Ser. No. 504,886
Claims priority, application United Kingdom, Sept. 18, 1973, 43632/73
Int. Cl.[2] F16D 33/06
U.S. Cl. 60—347 10 Claims

1. A hydraulic coupling comprising cooperating pump and turbine elements each having radial vortex-producing vanes and together forming a working chamber, a reservoir for working fluid operative with at least one of the pump and

turbine elements, the reservoir being movable between a coupling emptying position in which coupling working liquid



can flow thereto from the working chamber under gravity and a coupling filling position in which coupling working liquid can flow therefrom to the working chamber under gravity.

3,899,888

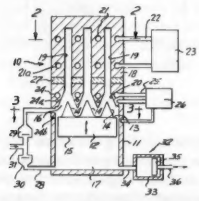
OSCILLATING PISTON APPARATUS

Mark Schuman, 101 G St., S.W., Apt. No. 516, Washington, D.C. 20024

Continuation of Ser. No. 227,514, Feb. 18, 1972, Pat. No. 3,807,904, which is a continuation-in-part of Ser. No. 121,371, March 5, 1971, abandoned. This application Apr. 29, 1974, Ser. No. 465,138. The portion of the term of this patent subsequent to Apr. 30, 1991 has been disclaimed.

Int. Cl. F03g *7/06*

U.S. Cl. 60—519 **88 Claims**



1. An oscillating piston apparatus comprising a cylinder, a free piston in the cylinder, said cyliner having a side wall with a port therein, a rebound chamber containing compressible fluid for reversing the motion of the piston. said rebound chamber having as a moving wall portion a face of the piston, means including said rebound chamber for sustaining oscillatory motion of the piston in the cylinder and means for controlling the location of the center of oscillation of the piston in the cylinder, said controlling means including said rebound chamber and a passageway communicating with the cylinder via the port, said passageway by-passing a portion, and only a portion of the axial length of the cylinder, said passageway having a fluid flow impedance which is substantially the same for fluid flow in either direction through the passageway, wherein said port, said by-passed portion of the cylinder, and an unbypassed portion of the cylinder are all at least partially traversed by the piston.

3,899,889

PEDAL RATIO CONTROL FOR HYDRAULIC BOOSTER

Kenneth B. Swanson, Bannister, and Herman M. Huffman, Owosso, both of Mich., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Apr. 15, 1974, Ser. No. 461,003

Int. Cl. F15b *7/00*

U.S. Cl. 60—547 **10 Claims**

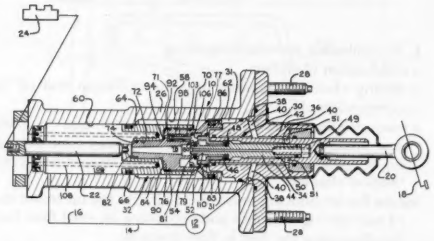
1. A booster brake mechanism operated by a source of hydraulic pressure and capable of being manually operated when said source of hydraulic pressure is insufficient to achieve desired braking, said booster comprising:

a housing having a large bore portion and a smaller bore portion contiguous therewith;

a power piston movable in said large bore portion and forming at one side thereof and within a portion of said large bore portion a power chamber;

an output piston movable in said smaller bore portion and extending into said large bore portion to form between the other side of said power piston, the remaining portion of said large bore portion and said output piston a fluid-containing, sealable ratio control cavity;

said output piston having a generally cylindrically-stepped hollow interior configuration, said power piston having a generally cylindrically-stepped exterior configuration received at least in part within said interior configuration of said output piston to define a fluid-containing, sealed piston chamber therebetween;



pilot valve means extending within said power piston providing fluid communication between said ratio cavity and said piston chamber in a normal unactuated position of said booster and movable to a second position to provide fluid communication between said ratio control cavity and said power chamber while trapping said fluid within said piston chamber;

inlet and outlet valve means between said source and said power chamber operative to pressurize said power chamber for moving said power piston thereby pressurizing at approximately equal pressure said ratio cavity and said piston chamber, such movement of said power piston simultaneously effecting a greater movement of said output piston; and

manually actuable valve means associated with said inlet and outlet valve means operable to actuate said pilot valve means to said second position for effecting approximately equal movements of said power piston and said output piston.

3,899,890

SERVO ASSEMBLIES AND SYSTEMS

Frederick John Adams, Campton, England, assignor to Cam Gears Limited, Hitchin, England

Filed Nov. 26, 1973, Ser. No. 419,110

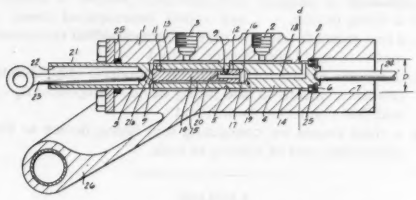
Claims priority, application United Kingdom, Dec. 15, 1972, 58125/72

Int. Cl. F15b *7/00*

U.S. Cl. 60—552 **25 Claims**

1. A servo assembly for transmitting motive force from an input to an output thereof and which comprises, a valve housing having a fluid pressure inlet port and a fluid outlet port; a working spool in the housing and axially slidable in a working cylinder; a control spool in the housing and axially slidable in a control cylinder; a reaction chamber formed between the control spool and the working spool; the working spool having an effective pressure area in the reaction chamber which is greater than the effective pressure area of the control spool in the reaction chamber; axial movement of the control spool being responsive to the input and the output being responsive to axial movement of the working spool; means communicat-

ing the reaction chamber to the outlet port in a neutral condition of the assembly and in the absence of axial pressure on the control spool, and wherein the control spool is arranged in response to axial pressure thereon, to close off communication of the reaction chamber with the outlet port and to communicate the reaction chamber to the inlet port whereby fluid pressure in the reaction chamber provides power assistance for applying pressure to the working spool in one axial direction, and provides a reactive force on the control spool in the opposite axial direction.



3,899,891

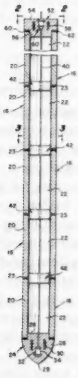
POST-TENSIONED PRESTRESSED PILE ASSEMBLY

William F. Kelly, 100 Bellaire Dr., and Robert B. Anderson, 5920 Memphis St., both of New Orleans, La. 70124

Filed Jan. 22, 1974, Ser. No. 435,446

Int. Cl.[2] E02D *5/30, 5/58*

U.S. Cl. 61—56 **14 Claims**



1. A post-tensioned prestressed pile assembly comprising:

a. a plurality of like, tubular shell sections arranged in vertical end-to-end relationship,

b. each of said shell sections comprising a wall of uniform thickness and a bore of uniform cross-sectional area,

c. the diameter of the bore of each of said tubular shell sections being substantially greater than the wall thickness,

d. a combination pile driving point and anchoring plug,

e. said pile driving point and anchoring plug including a main body section, the upper portion of which is reduced for insertion into an end of the lowermost shell section and the lower extremity being pointed for facility and driving the pile unit into the ground,

f. an anchor positioned in said main body section,

g. a head including a main body section, the lower portion of which is reduced for insertion into an end of the topmost shell section,

h. a live end anchor set in the main body section of said head,

i. tendon means extending longitudinally and centrally of the bores of said shell sections,

j. one end of said tendon means being connected to said anchor positioned in the main body section of said pile driving point and anchoring plug,

k. the opposite end of said tendon means extending through said live end anchor of said head, whereby said tendon means may be jacked for placing said tendon means under tension and said pile sections under compression, and

l. spaced alignment members disposed within the bore of the shell sections and spanning the joints between adjacent shell sections,

m. each of said spaced alignment members including an outer portion in frictional engagement with the walls of said shell section,

n. each of said spaced alignment members further including an inner portion having bore means through which said tendon means extend,

o. each of said spaced alignment members further including means connecting said outer and inner portions.

3,899,892

STEEL CABLE ANCHOR AND METHOD FOR WITHDRAWING THE SAME

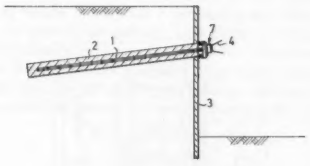
Hiroomi Yokota, Tokyo, and Taizo Masuda, Chiba, both of Japan, assignors to Yoshio Ichise, Tokyo, Japan

Filed Jan. 3, 1974, Ser. No. 430,548

Claims priority, application Japan, Feb. 8, 1973, 48-16032

Int. Cl.[2] E02B *3/12*

U.S. Cl. 61—39 **5 Claims**



1. A method for withdrawing a steel tension cable anchor embedded within hardening material in the ground, said cable anchor including a plurality of individual tension steel cables assembled in a bundle of cables, some but not all of said cables having their surfaces coated along at least the effective length thereof with an anti-friction material, the method comprising the steps of first withdrawing from said hardening material at least one individual cable whose surface is coated with said anti-friction material, and thereafter withdrawing the remaining individual steel tension cables.

3,899,893

ANCHORING PIN AND METHOD FOR STRUCTURES SUCH AS MINE AND TUNNEL ROOFS AND SIDE WALLS

Bani R. Banerjee, Skillman; Mukund D. Gangal, Plainsboro, and Sigmund Black, Belle Mead, all of N.J., assignors to Lee-Norse Company, Charleroi, Pa.

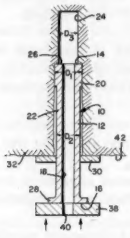
Filed Jan. 3, 1974, Ser. No. 430,407

Int. Cl.[2] E21D *21/00, 20/00*

U.S. Cl. 61—45 B **5 Claims**

1. An anchoring pin for anchoring structures such as mine and tunnel roofs and side walls, comprising an elongated body having a leading end and a trailing end, said body adjacent its said leading end including a leading portion of peripheral dimension greater than that of a thereafter following portion of said body, said leading portion being of outer diameter larger than the outer diameter of said following portion of said

body, said leading portion having an annular leading face extending transversely of the axis of said body capable of breaking-up and displacing material to cause lateral enlargement of a smaller diameter hole during driven insertion of the



pin, leading end first, therein, and said body having an axial bore which opens through its said leading and trailing ends for discharge of material broken-up and displaced by said leading face during such pin driven insertion.

3,899,894

APPARATUS FOR CONNECTION BETWEEN SUBMARINE CONDUITS

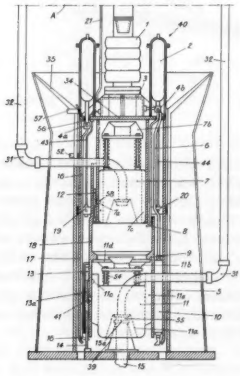
Jean A. Liautaud, Paris, France, assignor to Subsea Equipment Associates Limited, Hamilton, Bermuda

Filed Apr. 3, 1973, Ser. No. 347,513

Claims priority, application France, Apr. 10, 1972, 72.12485

Int. Cl. B63c *11/00*; **F16l** *35/00*

U.S. Cl. 61—72.3 **13 Claims**



1. Apparatus for providing a connection between a pair of conduits on the bed of a body of water without lifting the apparatus to the surface after effecting the first connection and before effecting the second connection even though the spacing between the conduits is not predetermined said apparatus comprising:

a. a flexible pipe having a first end and a second end remote from the first end;

b. a first connector means for attaching said flexible pipe to a first submarine conduit having an open face solely by an external force applied from the surface of the body of water in the direction perpendicular to the open face of the first conduit, said first connector means being attached to said flexible pipe at the first end thereof;

c. a second connector means for attaching said flexible pipe to a second submarine conduit having an open face solely by an external force applied from the surface of the body of water in the direction perpendicular to the open face of the second conduit, said second connector means being attached to said flexible pipe at the second end thereof;

d. a laying device;

e. a first means for detachably mounting said first connector means to said laying device;

f. a second means for detachably mounting said second connector means to said laying device independently of said first connector means; and

g. a third means for connecting said laying device to the underwater end of a string of rods.

3,899,895

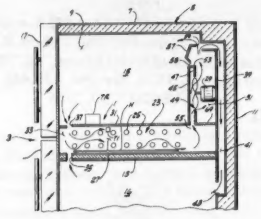
AUTOMATIC DEFROSTING CONTROL SYSTEM

Bobby D. Blanton, Hurst, and Glen C. Shepherd, Garland, , both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 15, 1974, Ser. No. 514,864

Int. Cl. F25d *21/06*

U.S. Cl. 62—155 **7 Claims**



1. An automatic defrosting control system for a refrigeration system having cooling means for absorbing heat from a zone to be cooled to a predetermined temperature level, said cooling means being subject to the accretion of frost thereon, said control system comprising:

means for causing defrosting of said cooling means;

a thermostat adapted to be positioned in heat-exchange relation with both said cooling means and said defrosting means and adapted for connection in a control circuit for said refrigeration system and having a first switching position for terminating operation of said defrosting means and a second switching position for enabling operation thereof, said thermostat switching from its first to its second position in response to its temperature falling to a lower predetermined level and switching to its first position in response to its temperature rising to a higher predetermined level;

a thermal time-delay relay adapted to be positioned in heat-exchange relation with said cooling means and adapted for connection in said control circuit and having a first switching position for permitting operation of said cooling means and a second switching position for energizing said defrosting means and preventing operation of said cooling means, said relay switching from its first switching position to its second position in response to its temperature falling to a lower predetermined level and switching to its first position in response to its temperature rising to a higher predetermined level; and

heating means adapted for connection in said control circuit for energization during at least a portion of the period that said relay is in its second position thereby to heat said relay to its higher predetermined temperature level whereby upon the temperature of said thermostat falling to its lower predetermined level and said relay cooling to its lower predetermined temperature level said thermo-

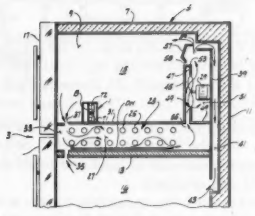
stat and relay will switch to their second positions thereby initiating defrosting.

3,899,896

AUTOMATIC DEFROSTING CONTROL SYSTEM

Samuel T. Bryant, Louisville, Ky., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 15, 1974, Ser. No. 514,860
Int. Cl. F25d *21/06*
U.S. Cl. 62—155 **14 Claims**



1. An automatic defrosting control system for a refrigeration system having cooling means for absorbing heat from a zone to be cooled and thermostatic means for periodically energizing the cooling means to maintain the zone substantially at a preselected temperature, said cooling means being subject to the accretion of frost thereon, said control system comprising:

means for causing defrosting of said cooling means;

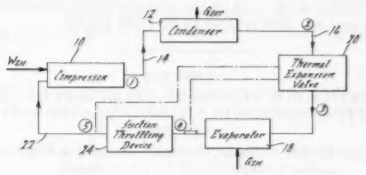
a first thermostat adapted to be positioned adjacent and in heat-exchange relation with both said defrosting and said cooling means and adapted for connection in a control circuit, said first thermostat having a first switching position for terminating operation of said defrosting means and a second switching position for enabling operation of said defrosting means, said first thermostat switching from its first to its second position in response to its temperature falling to a predetermined level and switching to its first position in response to its temperature rising to a predetermined level; and a second thermostat adapted to be positioned adjacent said cooling means but in a poorer heat-exchange relation therewith than is said first thermostat, said second thermostat adapted for connection in said control circuit, said second thermostat having a first switching position for permitting energization of said cooling means and a second switching position for energizing said defrost means and preventing operation of the cooling means, said second thermostat switching from its first to its second switching position in response to its temperature falling to a predetermined level whereby as frost tends to build up on the cooling means the temperatures of both thermostats are reduced until after a first time delay due to the thermal lag between the temperature of said cooling means and that of the first thermostat the latter is cooled sufficiently to switch to its second position and after a second and longer time delay, due to the greater thermal lag between the temperature of the cooling means and that of the second thermostat, the second thermostat thereafter cools sufficiently to switch to its second position thereby energizing the defrosting means.

3,899,897

BY-PASS SUCTION THROTTLING VALVE IN A REFRIGERATION SYSTEM

David H. Boerger, Inkster; Allen D. Krugler, Jr., Plymouth, and Donald A. Willoughby, Northville, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 3, 1974, Ser. No. 457,535
Int. Cl. F25b *41/00*
U.S. Cl. 62—196 **6 Claims**



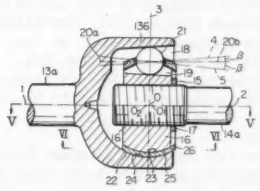
1. An air conditioning system comprising a fluid refrigerant in a closed circuit, said circuit including a compressor, a condenser and an evaporator located in series relationship, a thermal expansion valve in the circuit between the condenser outlet and the evaporator inlet, a suction throttling device located between the evaporator outlet and the compressor inlet, said thermal expansion valve comprising a variable flow restriction and a valve means for controlling the degree of restriction to refrigerant flow, said suction throttling device including a refrigerant flow restriction and valve means for controlling the flow through said restriction whereby the pressure differential across the suction throttling device for any given pressure on the outlet side of the evaporator is greater at low evaporator outlet pressures than at high evaporator outlet pressure, a controlled bypass flow passage from a point downstream of the thermal expansion valve to a point downstream of the suction throttling device including flow restricting means therein for determining the effective signal pressure in said bypass passage, said thermal expansion valve means including means responding to the temperature at the outlet of the evaporator and including means responding to the signal pressure in said bypass passage to vary the degree of flow restriction for the refrigerant entering the evaporator.

3,899,898

UNIVERSAL JOINT

Koichi Takahashi, Yokohama; Nobuteru Hitomi, Yokosuka, and Taisuke Kizu, Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed June 21, 1974, Ser. No. 481,783
Claims priority, application Japan, June 26, 1973, 48-72093
Int. Cl. F16d *3/30*
U.S. Cl. 64—21 **2 Claims**



1. A universal joint comprising an outer member having circumferentially uniformly spaced oblique grooves on its inner surface, an inner member disposable within said outer member, having circumferentially uniformly spaced oblique grooves on its outer surface equal in number to the grooves in said outer member, a plurality of power transmitting balls movably engaging the corresponding grooves of said members for transmitting torque from one of said members to the other

of said members, a ball retaining cage for maintaining said balls in a first plane which bisects the obtuse angle formed by the axes of said members, said cage being disposable between said inner and outer members, each of the grooves in said outer member having its axis skewed on a second plane parallel to the axis of said outer member at a first angle relative to said axis of said outer member and further skewed on a third plane normal to said second plane at a second angle relative to said axis of said outer member, and each of the grooves in said inner member having its axis extending in symmetrical relationship to the axis of the corresponding grooves in said outer member with respect to said first plane.

3,899,899

DEVICE FOR AUTOMATIC SELECTION OF THE KNITTING NEEDLES IN A HAND-OPERATED KNITTING MACHINE

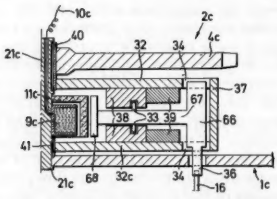
Manfred Bartels, Cologne, Germany, assignor to Empisal Knitmaster Luxembourg S.A., Luxembourg

Filed Oct. 7, 1974, Ser. No. 512,878

Claims priority, application Germany, Oct. 9, 1973, 7336353; Jan. 30, 1974, 2404307 [U]

Int. Cl.² D04B *7/00*

U.S. Cl. 66—75 **24 Claims**



1. A device for use in a hand operated knitting machine for automatic selection of knitting needles thereof, said device comprising a rotary pattern wheel, means for mounting said pattern wheel on a machine member for movement therewith, said pattern wheel including a plurality of circumferentially spaced control members arranges in a ring, said control members being of th rocker arm type, means mounting said control members for movement between a rest position and a work position for effecting selected predetermined positioning of knitting needles to reproduce a knitting pattern, electromagnetic means fixedly mounted within and concentrically of said ring of control members for timed excitation by an electrical pulse to selectively sequentially react on said control members and effect the positioning thereof, said pattern wheel being in axially symmetrical relation to said electromagnetic means.

3,899,900

WARP KNITTED GARMENTS AND APPARATUS AND METHOD FOR MAKING THE SAME

George Edward Jackson, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 776,938, Nov. 19, 1968, Pat. No. 3,656,324. This application Feb. 24, 1971, Ser. No. 117,925

Int. Cl.² D04B *23/02*

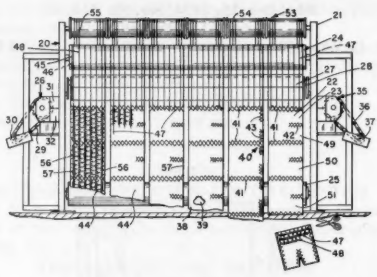
U.S. Cl. 66—87 **7 Claims**

1. The process of knitting a generally tubular garment adapted to conform to, and fit the human body, on a double needle bed, warp knitting machine, said process comprising the steps of:

knitting two superposed, single knit fabrics on said machine to form a two ply web advancing continuously in a walewise direction thereon;

periodically, after a predetermined number of stitches, cross interlooping said single knit fabrics to connect the same in a narrow, full width, substantially continuous band extending in a course-wise direction, thereby forming a succession of course-wise extending, open-ended tubes;

between said course-wise extending bands, at one end of each said tube, discontinuously cross interlooping said single knit fabrics to connect the same in predetermined areas thereof for a predetermined number of stitches extending in a walewise direction, and then single fabric knitting the same in other predetermined areas thereof



for a predetermined number of stitches in a walewise direction, thereby forming a shoulder, or crotch, partial closure associated with at least one limb, or neck, opening at said one end; and

between said course-wise extending bands, at the other end of each said tube, single fabric knitting said end to maintain a full opening, free of any partial closure, cross interlooping or interconnection to serve as a waist opening of a garment.

3,899,901

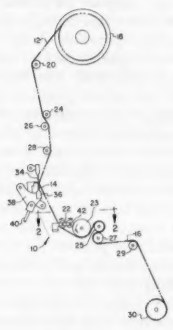
SELVAGE GUIDE AND BREAK-OUT PREVENTOR FOR KNITTING MACHINES

Bascum G. Lesley, Pickens, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 100,184, Dec. 21, 1970, abandoned. This application Dec. 10, 1973, Ser. No. 423,022

Int. Cl.² D04B *27/34*

U.S. Cl. 66—149 R **1 Claim**



1. A knitting machine comprising: needle means knitting yarn into fabric, fabric take-up means taking up the knit fabric, a first elongated roll means mounted on said knitting machine between said needle means and said take-up means to guide fabric from said needle means to said take-up means, a first pair of rolls each substantially shorter in length than said first elongated roll means and in nip forming relationship mounted between said means knitting yarn and said first elongated roll means with one roll of said pair of rolls being in engagement with one of the ends of said first elongated roll

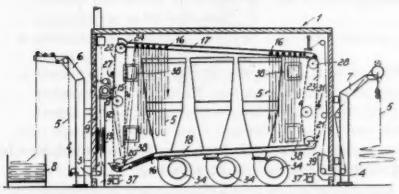
means, a second pair of rolls each substantially shorter in length than said first elongated roll means and in nip forming relationship mounted between said means knitting yarn and said first elongated roll means with one roll of said second pair of rolls being in engagement with the other end of said first elongated roll means, each of said rolls of said pairs of rolls having means to allow rotation in only one direction with the roll of said pairs of rolls not in engagement with said first elongated roll being adapted to contact the fabric being knit to prevent said needle means from jerking the knit fabric back toward said needle means, and means to drive said elongated rolls means to cause said each one roll of said first and second pairs of rolls in engagement with said elongated roll means to rotate in a direction to guide the fabric under said first and second pairs of rolls and said elongated roll means to said fabric take-up means.

3,899,902

PLANT FOR STEAMING AND FIXING DYES AT HIGH OR LOW TEMPERATURE ON PRINTED OR DYED FABRICS

Fulvio Conti, via Carnovali 88, Bergamo, Italy (24100)

Filed Dec. 26, 1973, Ser. No. 428,634
Claims priority, application Italy, May 29, 1973, 24669/73
Int. Cl. D06c *1/08;* **B65h** *17/06*
U.S. Cl. 68—5 D **2 Claims**



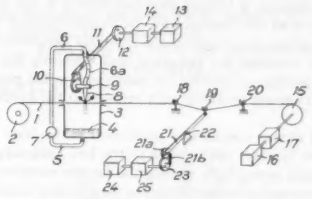
1. A plant for steaming and fixing dyes at high or low temperature on printed or dyed fabrics, comprising a storage chamber having an inlet zone and outlet zone for the fabric, means for disposing the fabric inside said chamber in the form of suspended folds side by side and for moving said folds from said inlet zone to said outlet zone, means for maintaining the atmosphere inside said chamber at controlled humidity and temperature conditions, and means for preheating and humidifying the fabric before its introduction into the zone of controlled atmospheric conditions and wherein said means for disposing the fabric in the form of folds and for moving said folds comprise a plurality of rod elements mobile along a perimetral closed loop path maintaining the longitudinal axis of said rod elements substantially horizontal and orthogonal to the direction of forward movement of the fabric, each of said rod elements being arranged to support a fold of fabric through the upper portion of said path between said inlet zone and said outlet zone, guides for supporting said rod elements disposed in the lower and upper portions of said path and extending in the direction of forward movement of the fabric, and a pair of devices comprising members mobile in a substantially vertical direction disposed in said inlet and outlet zones between the corresponding ends of said upper and lower guides, and arranged to successively take a single rod element at the terminal ends of the upper and lower portions of said path and to deposit it at the initial ends of said upper and lower portions and wherein said upper and lower guides are inclined downwards in the direction of forward movement of the fabric and in the opposite direction, respectively.

3,899,903

APPARATUS FOR THE LOCAL TREATMENT OF YARNS, FOR EXAMPLE THE NON-CONTINUOUS DYEING OF TEXTILE YARNS

Philippe D. Lapierre, Saint Quentin, France, assignor to Societe Anonyme dite: Omnium de Prospective Industrielle S.A., Neuville Saint-Amand, France

Filed Mar. 26, 1973, Ser. No. 344,998
Claims priority, application France, Mar. 28, 1972, 72.10915
Int. Cl. B05c *5/00;* **B05b** *13/04*
U.S. Cl. 68—205 R **6 Claims**



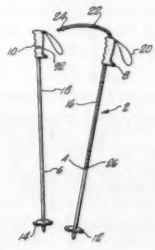
1. An apparatus for the irregular treatment of at least one yarn including a treatment station, first drive means for moving the yarn to be treated continuously through said station in an axial and relatively fixed direction; at least one fluid supply nozzle movably mounted in said treatment station in a plane extending generally perpendicular to the yarn passing therethrough; means for supplying fluid to said nozzles; second drive means for reciprocating said nozzle transversely to the direction of travel of yarn through said treatment station; and regulating means for varying at least one of the speed of movement of the yarn or the speed of reciprocation of the nozzle during treatment of said yarn whereby irregular treatment of the yarn is effected; wherein said regulating means comprises at least three successive guides located between said first drive means and said nozzle at the treatment station; the outer two of said guides being fixed and a middle one being movably mounted and displaceable relative to the other two guides.

3,899,904

SKI POLE LOCKING ASSEMBLY

George Henry Brimhall, II, P.O. Box 733, Sunset Beach, Calif. 90650

Filed July 9, 1973, Ser. No. 377,616
Int. Cl.[2] **E05B** *73/00*
U.S. Cl. 70—58 **3 Claims**



1. A set of ski poles wherein each ski pole has a handle portion and a bracket portion interconnected by a hollow pole member to assist a skier in protecting his equipment, comprising:

at least one handle portion having a bore therethrough;

an elongated flexible member having a locking head portion connected for limited relative movement to one of the ski

poles and movable into and out of the hollow pole member through the bore in the first handle portion;

means on the handle portion for covering the opening of the bore on the handle portion when the elongated flexible member is retracted into the pole for storage and coacting with the locking head portion to facilitate the withdrawal of the elongated flexible member from the hollow pole member;

a key member having camming portions;

a locking apparatus mounted in the handle portion of the other ski pole, including a casing member having a longitudinal axis and at least one side wall adapted to be connected to the handle, the side wall having at least one bore therein, a keeper member having a key guideway and at least one passageway, the keeper member movable only along the longitudinal axis and positioned in the casing member for fastening and releasing the locking head portion, a tumbler pin positioned in the passageway and relatively movable with respect to the keeper member;

resilient means operatively positioned in the bore for biasing the tumbler pin relative to the key guideway; and

bias means operatively biasing the keeper member relative to the casing member along the longitudinal axis whereby the cam portions of the key member are capable of depressing the tumbler pin against the resilient means to permit the keeper member to move relative to the casing member for fastening or releasing the locking head portion whereby the elongated flexible member can be utilized to secure skis and the like and to further interconnect both ski poles against unauthorized removal.

3,899,905

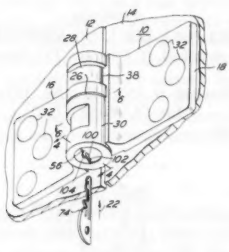
LOCKING BAR ASSEMBLY

Russell W. Walters, Reading, Pa., assignor to BMR Security Products Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 277,565, Aug. 3, 1972, Pat. No. 3,827,266. This application May 30, 1973, Ser. No. 365,099The portion of the term of this patent subsequent to Aug. 6, 1991, has been disclaimed.

Int. Cl.[2] E05B *63/00*

U.S. Cl. 70—91 **8 Claims**



1. An improved locking bar assembly including a pair of strike plates having lug members, tubular means insertable through a bore formed within each of said lug members, a cylindrical key lock within said tubular means for displacing a locking pin through an opening in said tubular means into and out of engagement with at least one detent formed in one of said lug members, where the improvement comprises:

each said lug member having an upper surface, a lower surface and an outer side surface, said upper and lower surfaces formed transverse of said bore within said lug member, said outer side surface having at least one larger diameter section and at least one smaller diameter section, said outer side surface formed between said upper and lower surfaces;

at least one first mating means formed by at least one of said strike plates; the different diameter sections of said outer side surface forming second mating means, said first mating means of one of strike plates and said second mating means of said lug member of the other of said strike plates being received one in the other when said bores are aligned;

lock securing means formed substantially near one end of said tubular means for securing said key lock within said tubular means independent of said locking pin.

3,899,906

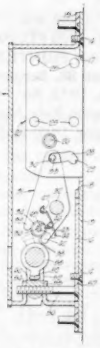
LOCK MECHANISM

Richard L. Bradstock, Burbank, Calif., assignor to Adams Rite Manufacturing Company, Glendale, Calif.

Filed Feb. 22, 1974, Ser. No. 444,955

Int. Cl.[2] E05B *65/06*

U.S. Cl. 70—139 **6 Claims**



1. A locking mechanism for a movably mounted door having a relatively narrow stile, comprising:

a. a casing structure positionable in said stile, said structure having an opening adapted to be positioned adjacent a vertical edge face of said stile;

b. a bolt pivotally supported in said casing for swinging selective movement to a retracted unlocked position within said casing and to an extended locked position projecting through said opening;

c. a bolt actuating lever pivotally supported between its ends in said casing for rocking movement,

one end of said actuating lever being connected with said bolt,

the other end of said actuating lever having an open ended slot with a relatively wide outer end portion extending between spaced end abutment projections, and an axially aligned relatively narrow inner end portion;

d. latching means carried by said other end of said lever for releasably latching said bolt in its extended and retracted positions, including:

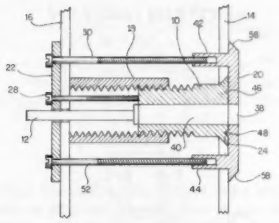
a spring-urged roller having a portion of reduced diameter between its ends supported for outward and inward movements in said narrow inner portion of said slot, said roller being normally biased to a latching position extending into the relatively wide outer portion of said slot; and

e. manually operable means including an element swingably rotatable in opposite directions to initially release said latching means in both the extended and retracted positions of said bolt and thereafter rock said lever to selectively move the bolt from one of said positions to the other of said positions, said element being engageable with said roller and operative to move it to a non-latching position prior to engagement with one of said abutment projections.

3,899,907
CYLINDER LOCK ASSEMBLY

Herman Prahl, 48-38 Fifty-eighth Ln., Woodside, N.Y. 11377

Filed June 18, 1973, Ser. No. 370,934
Int. Cl.² E05B *9/08*
U.S. Cl. 70—370 **4 Claims**



1. A cylinder lock assembly, comprising:

a cylinder lock having an externally threaded housing having front and rear surfaces and having a key plug extending through said housing, said key plug having a key slot therein and a key hole exposed at the front surface of said housing;

adjustable extension means having an internally threaded aperture therein for threadedly mating with said externally threaded housing for adjusting the combined length of said cylinder lock and extension means to approximately the width of a door in which said cylinder lock assembly is to be installed;

a plurality of threaded bores in said rear surface of said housing;

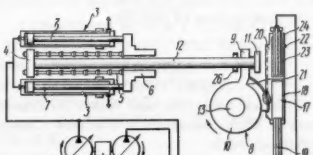
a plurality of screws of a length greater than the difference between the length of said housing and said combined length for securing said assembly to a door; and

end plate means having a plurality of apertures therein in alignment with said threaded bores in said rear surface of said housing for receiving said screws and securing said assembly to a door.

3,899,908
DEVICE FOR BENDING PIPES WITH SIMULTANEOUS UPSETTING

Boris Stepanovich Somov, partizan, 3, kv.22; Alexandr Ilich Mamin, skaya, 69a, kv.5; Andrei Porfirievich Novikov, ulitsa Sotsialisticheskaya, 7, kv.13; Vyacheslav Ivanovich Filippov, ulitsa Polzunova, 24, kv.1; Sergei Grigorievich Khirdzhiev, ulitsa Bakinskikh komissarov, 58, kv.48, all of Sverdlovsk; Vladimir Zakharovich Gurevich, Yasny proezd, 4, korpus 1, kv.20, Moscow; Nikolai Stefanovich Voronov, ulitsa Bogdana Khmelnitskogo, 68, kv.18, and Ivan Fedorovich Agafonov, ulitsa Bogdana Khmelnitskogo, 101, kv.69, both of Belgorod, all of U.S.S.R.

Filed Sept. 12, 1974, Ser. No. 505,596
Int. Cl. B21b *37/06*
U.S. Cl. 72—28 **3 Claims**

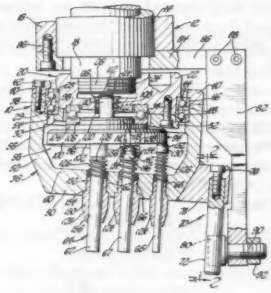


1. A device for bending pipes comprising a bed in which the pipe to be bent is set with a provision for longitudinal movement; power cylinders for moving the pipe longitudinally on the bed; a bending head mounted on the bed rotatably in the bending plane; another power cylinder whose movable portion is connected with the bending head and which builds up a braking moment while said head is turned in the course of bending; one more power cylinder whose body is rigidly connected with the body of the braking power cylinder which is linked by its movable body with the bending head; a controllable source of pressure communicating with the power cylinder which is connected to the braking power cylinder.

3,899,909
TOOL HEAD ASSEMBLY FOR IMPARTING ROTARY ROCKING MOTION TO A TOOL

Vladimir Taruntaev, Davison, Mich., assignor to VSI Automation Assembly, Inc., Troy, Mich.

Filed June 17, 1974, Ser. No. 480,122
Int. Cl.² B21J *15/12*
U.S. Cl. 72—112 **58 Claims**



1. A tool head assembly comprising: a circular drive member adapted for attachment to a rotatably driven member for rotatable movement about an axis of rotation extending through said drive member, the central axis of said drive member being parallel to, but nonconcentric with respect to the axis of rotation; tool support means including means for axially slidably supporting a tool member; connecting means for connecting said tool support means to said drive member, said connecting means including a bearing set canted with respect to the axis of rotation such that the central axis of said tool support means is angularly offset from the axis of rotation; means for preventing rotation of said tool support means with said circular drive member; and thrust transmitting means carried by said rotatable circular drive member and in thrust transmitting relationship therewith for transmitting thrust to a tool member, the central axis of said thrust transmitting means being coincident with the axis of rotation.

3,899,910
PRESTRESS TYPE ROLLING MILL

Keiichi Aramaki, Fukuyama, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1974, Ser. No. 474,403
Claims priority, application Japan, June 19, 1973, 48-68277
Int. Cl.² B21B *31/08*
U.S. Cl. 72—239 **7 Claims**

1. A prestress type universal rolling mill, comprising:

a lower housing;

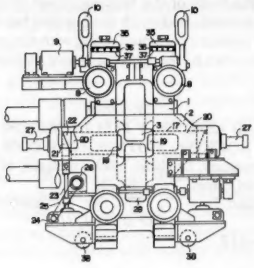
a bottom horizontal roll mounted to said lower housing;

an upper housing removably coupled to said lower housing;

a top horizontal roll mounted to said upper housing;

a pair of vertical rolls directly supported on said lower housing and being removably mounted to said lower housing, said vertical rolls being removable by lifting thereof substantially in the vertical direction when said upper and lower housings are separated; and

mounting and joining means including generally vertically oriented side tapered guide surface means on said upper and lower housing for removably mounting and joining said upper housing to said lower housing, whereby a



horizontal force exerted on said top horizontal roll is transmitted from said upper housing through said side tapered guide surface means and is borne by said lower housing.

3,899,911

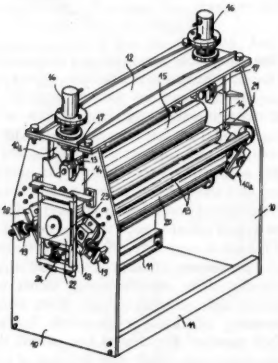
SHEETMETAL ROLLING MACHINE

Paul Ogier, Vaugneray, and Christian Queyroix, Lyon, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed Mar. 27, 1974, Ser. No. 455,191

Int. Cl. B21d *5/14*

U.S. Cl. 72—169 **3 Claims**



1. A machine for the curving and rolling of sheet metal, and comprising:

a rigid forming roller;

means for mounting one end of the forming roller to allow free floating of the forming roller during operation of the machine and to allow for easy removal of the sheet metal from the unmounted end after rolling;

a plurality of curving rollers disposed at arcuately spaced locations around the forming roller, the curving rollers having a cover fabricated from a pliable elastic material; movable pillow block mount means, the curving rollers being mounted in said movable pillow block mount to permit radial adjustment of the curving rollers with respect to the forming roller; and

means carried by the pillow block mount means for locking the curving rollers into desired radial positions with respect to said forming roller to allow the curving rollers to rotate about a fixed axis during the sheet metal rolling operation.

3,899,912

METHOD AND DEVICE FOR COLD-FORMING ROLLING ELEMENTS

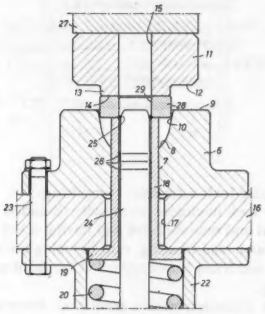
Michel Orain, Conflans-Sainte-Honorine, France, assignor to Societe Anonyme: Glaenzer Spicer, Poissy, France

Filed June 29, 1973, Ser. No. 375,122

Claims priority, application France, July 10, 1972, 72.24973

Int. Cl.[2] B21J *13/02, 13/14*

U.S. Cl. 72—344 **6 Claims**



1. Apparatus for carrying out a method for cold-forming a rolling element comprising a body of revolution with an external rolling surface having straight or curved generatrices extending between a portion of relatively large diameter, and a portion of relatively small diameter, in which method a cylindrical blank, the diameter of which is substantially equal to the maximum diameter of the element, is compressed in a cup whose internal profile is identical to the external profile of the element by overcoming an increasing counter-pressure exerted on the blank; the forcing of the blank into the cup being halted at a predetermined stage, said apparatus comprising a die formed with a cup having an internal wall the profile of which is identical to the external profile of said rolling surface of said element, a plane bearing face of said die perpendicular to the revolution axis of said cup, a conical extension of said wall in communication with said plane bearing face of the die, a passage in said die extending from said cup surface remote from said plane bearing face and having a diameter substantially equal to the smallest diameter of said element, a sliding ejector disposed in said bore, counter-pressure means arranged to provide a force resisting movement of said ejector into said passage and which increases with the degree of penetration, a plunger having a first bearing face adapted to engage said bearing face of the die and a circular second bearing face projecting from said first bearing face, said second bearing face having the same form as the greatest diameter face of said element and being of a size to enter said conical extension of said cup wall, said die and said plunger being mounted for relative displacement so that said second bearing face of said plunger enters said cup, while being maintained strictly coaxial with said cup, until said first bearing face of said plunger engages said bearing face of said die.

3,899,913

SHEET WRAPPER

James A. Schlosser, Essexville, and Walter A. Trumbull, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

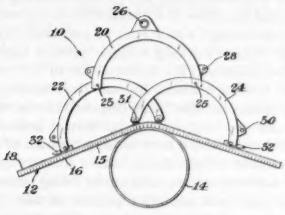
Filed May 10, 1974, Ser. No. 469,142

Int. Cl. B21d *5/02*

U.S. Cl. 72—383 **13 Claims**

1. A sheet wrapper for wrapping relatively flat sheets about the circumference of an article, said wrapper comprising a multiple component yoke assembly including a central yoke

arm and yoke-shaped end rocker arms having center pivots, each of said arms presenting substantially similar inside curvilinear configurations which configurations are about the same as the outside curvilinear configuration of the sheet when



wrapped about the article, the central yoke arm supporting adjacent each of its ends a center pivot of one of said rocker arms thereby keeping the same substantially equidistant from the longitudinal centerline of the article.

3,899,914

APPARATUS FOR CLOSING A CUT END OF A BLOOD VESSEL

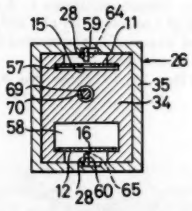
Taichiro Akiyama, 19-23, Shimoochiai 2-chome, Shinjuku-ku, Tokyo, Japan

Filed Jan. 9, 1974, Ser. No. 432,052

Claims priority, application Japan, Jan. 20, 1973, 48-8875; Jan. 20, 1973, 48-8876; Jan. 20, 1973, 48-8878

Int. Cl. B21d *9/08*

U.S. Cl. 72—410 **16 Claims**



1. An apparatus for closing a cut end of a blood vessel with a pair of closing members, comprising means for supporting and guiding a pair of strips with each strip being formed of a series of closing members, a pair of actuating members to press successive pairs of closing members against one another with the cut end of a blood vessel therebetween, said actuating members operating to concurrently fasten said pair of closing members together, feeding means for feeding intermittently said strips to provide successive pairs of closing members at said actuating members, and cutting means for automatically cutting one pair of closing members from said pair of strips during each pressing and fastening operation.

3,899,915

CONVEYOR SCALE CALIBRATION

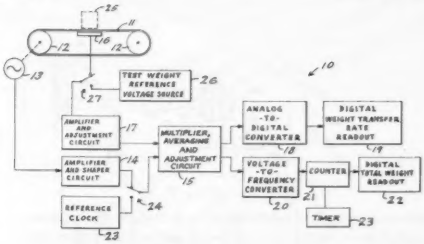
Roger B. Williams, Jr., Sylvania, Ohio; Richard C. Loshbough, Temperance, Mich., and Richard A. Cherry, Toledo, Ohio, assignors to Reliance Electric Company, Toledo, Ohio

Filed Nov. 7, 1973, Ser. No. 413,657

Int. Cl.[2] G01G *11/00, 23/00*

U.S. Cl. 73—1 R **13 Claims**

1. Measuring apparatus for use with a conveyor for moving material through a region comprising, in combination, means for generating an electric speed signal corresponding to the speed of the conveyor, means for generating an electric weight signal corresponding to the weight of material in the region, multiplying means responsive to said speed and weight signals for generating an electric signal which is a measure of the weight transfer rate, and means for calibrating said measuring apparatus, said calibrating means including means for applying to said multiplying means a weight signal corresponding to a predetermined weight, means for generating an electric signal for simulating said speed signal at a predetermined constant conveyor speed, switch means for selectively applying said simulated speed signal to said multiplying means in place of said conveyor speed signal whereby said weight transfer rate signal is generated in response to said simulated speed signal and said predetermined weight signal, and means for adjusting said measuring apparatus to eliminate any deviation in said weight transfer rate signal from a true weight transfer rate signal for such predetermined constant conveyor speed and predetermined weight in the region.



3,899,916

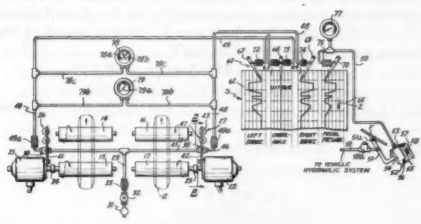
RECORDER AND COMPUTER TYPE BRAKE ANALYZER AND METHOD

Edwin Lee Cline, Pasadena, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.

Continuation-in-part of Ser. No. 811,168, March 27, 1969, abandoned. This application July 25, 1973, Ser. No. 382,538

Int. Cl. G01l *1/28*

U.S. Cl. 73—126 **147 Claims**



1. Apparatus for analyzing the performance of the brakes on the wheels of a vehicle while force is being applied thereto by a brake actuator, comprising:

test means for rotating at least one pair of wheels of the vehicle;

means for separately and continuously measuring the brake effort of each of the brakes of said wheels as the brake actuator is operated;

recording means actuated by said measuring means and including means for simultaneously and continuously recording the variations, if any, in brake effort on each wheel, the imbalance in brake effort, if any between the wheel brakes, and the degree of brake actuator operation;

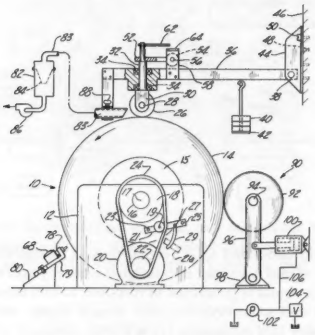
a computer connected in circuit with said recorder for comparing the recorder values with pre-established stndard values for the test being conducted; and

a printer connected with the computer, for printing the variations in the test values from the standard values.

3,899,917
LABORATORY WEAR RESISTANCE TEST MACHINE FOR TIRES

Frederick N. Kisbany, 464 Lexington Rd., Gross Pt. Farms, Mich. 48236

Filed Dec. 6, 1973, Ser. No. 422,459
Int. Cl. G01n *3/56*
U.S. Cl. 73—8 **8 Claims**

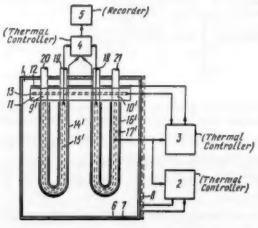


1. A tire wear tester comprising power means for rotating a tire under test; a non-powered abrasive wheel freely rotatably mounted so that its peripheral edge rolls on the tire tread surface, to thereby generate tire tread particulates; means for selectively adjusting and positioning the abrasive wheel with its rotational axis slightly askew of the tire axis, whereby the tire tread is required to skid on the abrasive wheel surface; and means to measure tread wear generated by the abrasive wheel.

3,899,918
DIFFERENTIAL MICROCALORIMETER

Petr Leonidovich Privalov, mikroraion V, 29, kv. 38; Pavel Semenovich Makurin, mikroraion V, 22, kv. 46; Valerian Valerievich Plotnikov, mikroraion G, 9, kv. 47; Vladimir Vasilievich Koryagin, mikroraion V, 8, kv. 23; Viktor Sergeevich Polpudnikov, mikroraion V, 24, kv. 5, and Georgy Pavlovich Stepanjuk, mikroraion V, 25, kv. 16, all of Puschino Moskovskoi oblasti, U.S.S.R.

Filed Mar. 5, 1973, Ser. No. 338,229
Int. Cl. G01k *17/00;* **G01h** *25/20*
U.S. Cl. 73—15 B **1 Claim**

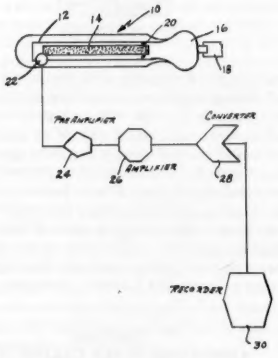


1. A differential microcalorimeter comprising: a calorimetric unit including a shield; a sample calorimetric chamber provided with a heating element and a heat sensing element, and made as a capillary tube inserted inside said shield so that the inlet and outlet of said capillary tube, through which said chamber is respectively filled and emptied are located outside said shield; a reference calorimetric chamber provided with a heating element and a heat sensing element, and made as a capillary tube inserted inside said shield so that the inlet and outlet of said capillary tube, through which said chamber is respectively filled and emptied, are located outside said shield; at least one heat shunt comprising an element made of a material having a high heat conductivity and having a heater, said capillary tubes extending through said shunt and having good thermal contact therewith, each of said capillary tubes being divided by said shunt into a non-working portion extending beyond the shunt to form said inlets and outlets of said capillary tubes through which each of said chambers are filled and emptied, and a working volume portion that is not enclosed by said shunt and is a continuation of said non-working portion, said heating element and said heat sensing element of each calorimetric chamber being disposed on the surface of its respective said working volume portion; a heat sensing element of said heat shunt; a heat sensing element of said shield; a heating element of said shield; a first thermoregulator with two inputs and one output, said inputs being connected to at least one of said heat sensing elements of said calorimetric chambers and to said heat sensing element of said shield, and the output being connected to said heating element of said shield; a second thermoregulator with two inputs and one output, one of the inputs being connected to the same heat sensing elements of said calorimetric chambers as the first thermoregulator, the other input being connected to said heat sensing element of said heat shunt, and the output being connected to said heating element of said heat shunt; a third thermoregulator with two inputs and three outputs, said inputs being connected to the respective heat sensing elements of said chambers, and two of said three outputs being connected to said heating elements of said chambers, and a recorder connected to said third output of said third thermoregulator for recording the results of measurements.

3,899,919
ACOUSTIC EMISSION SYSTEM FOR SOLID PROPELLANT BURN RATE MEASUREMENTS

Robert L. Geisler, Tehachapi; James L. Koury, and Arch D. Johnston, both of Lancaster, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 21, 1973, Ser. No. 427,159
Int. Cl.[2] G01N *33/22*
U.S. Cl. 73—35 **1 Claim**



1. A system for measuring the rate time of burn of solid propellants in a solid strand burn rate analyzer comprising: A propellant strand secured in an analyzing means; a piezoelectric pick-up transducing means affixed to said propellant strand for measuring thermal fracture and deflagration of the solid oxidizer; means connected to said transducing means for amplifying the output signal thereof; means connected to the amplifying means for converting an AC signal to a DC signal and providing a root mean squared wave form distribution signal, and graphic recording means connected to said converting means for presenting a visual display of the propellant burning rate.

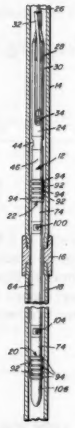
3,899,920

TUBING TESTING TOOL

Carrol J. Matherne, P.O. Box 763, Houma, La. 70360

Filed Mar. 27, 1974, Ser. No. 455,324
Int. Cl. G01m 3/08
U.S. Cl. 73—40.5 R 14 Claims

1. A tool for pressure testing tubing, pipe and the like comprising an upper packer and a lower packer, each packer including a mandrel, means extending between the mandrels to retain the packers in longitudinally spaced relation, each packer including a deformable packing means expansible into sealing contact with the interior of the tubing to isolate a test space, each mandrel extending throughout the length of the packing means, said tool including passage means for packer setting fluid communicating with the periphery of each mandrel adjacent a peripheral shoulder thereon, a sleeve slidable on each mandrel and including an internal flange in spaced,



opposed relation to the shoulder to define a setting chamber for receiving setting fluid for moving the sleeve longitudinally on the mandrel, said packing means including at least one resilient, deformable annular packing member in encircling relation to the mandrel with an end portion of the sleeve engaged therewith for compressing the packing member and expanding it circumferentially toward the tubing surface, said passage means also including a portion for discharging test fluid into the test space, each of said mandrels being unitary and identical in construction.

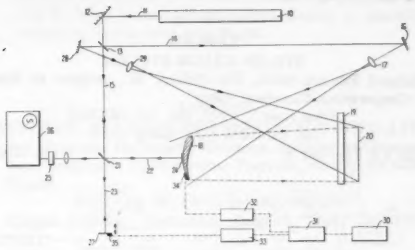
3,899,921

METHOD AND APPARATUS FOR TESTING AN OBJECT

Bernard Spencer Hockley, Ambergate, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Oct. 30, 1973, Ser. No. 411,093
Claims priority, application United Kingdom, Nov. 2, 1972, 50634/72
Int. Cl. G01n 21/00
U.S. Cl. 73—67.2 16 Claims

1. A method of testing an object comprising the steps of:
splitting a beam of laser radiation into a first and second portion,
illuminating the object with the first beam portion,
vibrating the object,
modulating the phase of one beam portion in a first predetermined phase relationship with the vibration of the object,
combining the radiation scattered from the object with the second beam portion to form a hologram,
altering the modulation of the phase of the modulated beam portion to a second predetermined phase relationship, and
combining the radiation scattered from the object with the



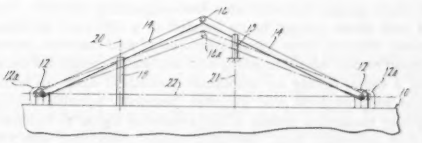
second beam portion to modify said hologram to contain information from said conditions of phase modulation.

3,899,922

DOUBLE LEVER STRAIN MULTIPLIER APPARATUS AND METHOD

Nelson M. Mercer, Jr., Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 5, 1973, Ser. No. 422,111
Int. Cl.[2] G01B 7/16
U.S. Cl. 73—88.5 R 7 Claims



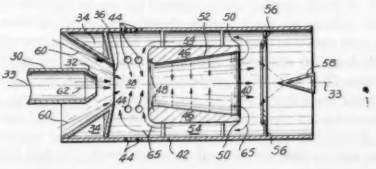
1. Apparatus for multiplying the strain produced in a structural component comprising:
a pair of pivotally interconnected lever arm members including means for pivotally attaching the free ends of said lever arm members to a structural component; and
at least one strain gauge means having one end attached to at least one of said pair of lever arm members and attachable at an opposite end to the structural component so that an imaginary line drawn between the structural component attachment ends of the pair of lever arm members will pass through the end of the strain gauge means which is attachable to the structural component.

3,899,923

TEST PROCESS AND APPARATUS FOR TREATMENT OF JET ENGINE EXHAUST

Aaron J. Teller, Great Neck, N.Y., assignor to Teller Environmental Systems, Inc., Worcester, Mass.

Filed May 13, 1971, Ser. No. 143,066
Int. Cl. G01m 15/00; F01n 33/04
U.S. Cl. 73—116 35 Claims



1. A process for treating the hot exhaust gases from a jet engine mounted on a test stand comprising the steps of: intro-

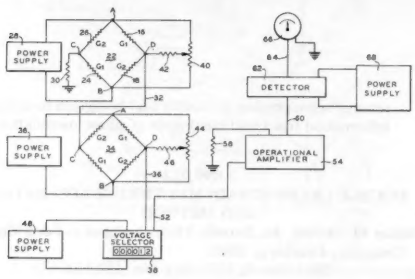
ducing water to said exhaust gas in a mixing zone together with augmentation air; passing the mixture formed through an augmentation zone; and recycling a portion thereof back to the said mixing zone.

3,899,924

STRAIN GAUGE SYSTEM

Richard Edward Klein, Des Plaines, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed June 7, 1973, Ser. No. 367,828
Int. Cl. G01l *1/22*; **G01g** *19/08*
U.S. Cl. 73—141 A **6 Claims**



1. A strain gauge load measuring system comprising a pair of strain gauges mounted on a load-supporting member, each of said strain gauges being located at a different predetermined distance from a supported end of said member, bridge circuit means interconnected with said strain gauges for deriving a signal having an amplitude dependent upon an actual load supported by said member, manually settable voltage divider means for setting a first reference signal to represent a first reference load, detector means connected with said bridge circuit means and with said voltage divider means for producing a signal indicating a net difference between said actual load signal and said first reference signal, means for producing a second manually adjustable reference level to represent a partial load, and comparator means for comparing said net difference signal and said second reference level and operative to produce a binary signal indicating the polarity of said net difference signal relative to said second reference level, whereby said binary signal is in a first binary state when said net difference signal is one one side of said second reference level and in a second binary state when said net difference signal is on the other side of said second reference level.

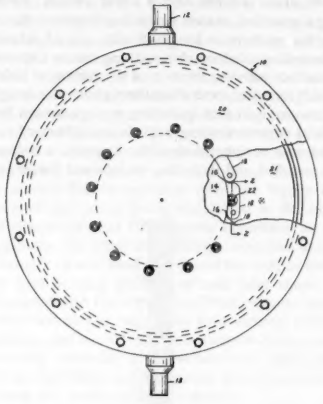
3,899,925

VALVE SYSTEM FOR CONFINED VORTEX FLOW SYSTEM

Brian A. Hausfeld, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 17, 1974, Ser. No. 434,154
Int. Cl. G01m *9/00*; **G01n** *1/04*
U.S. Cl. 73—147 **3 Claims**

1. A three position valve system for use in a confined vortex flow system having a vortex chamber formed between a pair of wall members with means for forming a circumferential wall for said chamber and including means for providing a vortex flow of a low molecular weight gas in a flow path around the central axis of said chamber, comprising: a cylindrical shaped chamber in said circumferential wall and having an elongated opening on the side adjacent said vortex chamber; said cylindrical shaped chamber having its axis parallel to the axis of the vortex flow path within said chamber; a hollow elongated tubular member positioned within said cylindrical shaped chamber; said tubular member having a first means, in a first circumferential position of the valve, for directing particle flow into said vortex chamber in the direction of gas flow within the vortex chamber; said tubular member having a second means, in a second circumferential position of the valve, for intercepting the flow of particles within the vortex chamber to remove particles from the chamber; said tubular



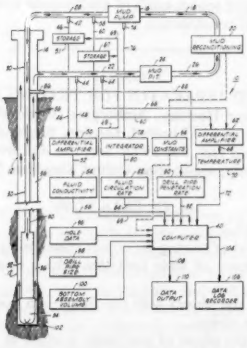
member having a third means, in a third circumferential position of the valve, adapted to be positioned adjacent said vortex chamber, for providing a smooth flow surface, for the gas flow within said vortex chamber; means for selectively positioning the valve in one of its three positions.

3,899,926

METHOD AND APPARATUS FOR CONTINUAL COMPILATION OF A WELL DATA LOG

Elard L. Haden, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed July 3, 1972, Ser. No. 268,399
Int. Cl. E21b *47/00*
U.S. Cl. 73—153 **8 Claims**



1. A method for deriving a continuous pseudo-resistivity log indication of selected sub-strata through which a bore hole is being formed utilizing drilling equipment with drilling fluid circulation equipment, comprising the steps of:

continually deriving first electrical resistivity measurements from the drilling fluid entering said bore hole;

storing said first electrical resistivity measurements for a duration equal to circulation time of a drilling fluid;

continually deriving second electrical resistivity measurements from the drilling fluid out-coming from said bore hole;

whereby the crimp contraction may be determined directly as a percentage of said predetermined interval between said two clamping points.

3,899,927

METHOD AND APPARATUS FOR THE MEASUREMENT OF CRIMP CONTRACTION

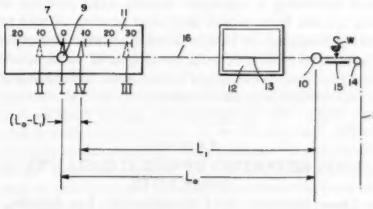
Hans-Joachim A. Brassard, and Andreas Erkens, both of Heinsberg, Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 29, 1973, Ser. No. 410,422

Claims priority, application Germany, Nov. 4, 1972, 2254026

Int. Cl. G01n *3/28*

U.S. Cl. 73—160 7 Claims



1. A method for the rapid measurement of the crimp contraction of a texturized yarn which comprises:

clamping a length of said texturized yarn in a straight line path between two points spaced at a predetermined interval while said yarn is under an initial tensional load sufficient to remove slack from the yarn and to draw out at least part of its normal crimp;

briefly extending the yarn longitudinally through movement of a first clamped point thereof by an amount of about 5 to 20% and sufficient to ensure the complete drawing out of the normal crimp and to temporarily stress said yarn without imparting any substantial permanent extension thereto;

immediately thereafter completely relaxing said yarn through movement of said first clamped point in the longitudinal direction of the yarn opposite that of the preceding extension step in order to redevelop the normal crimp of the yarn; and

then extending the yarn again only until it is brought back approximately to said straight line path between the two clamping points through another movement of said first clamped point in the same longitudinal direction of the yarn as said preceding extension step,

deriving a difference resistivity between said stored first electrical resistivity and the second electrical resistivity measurements;

continually deriving an indication of drilling penetration depth, and periodically deriving an indication of penetration depth change;

generating an indication of the total drilling fluid volume in the bore hole as well as the drilling fluid circulation rate as a function of time to determine the amount of time for a unit portion of drilling fluid to circulate from the bore hole bottom to the bore hole top; and

recording said differential resistivity measurement on a time base delayed by said amount of time for a given portion of fluid to circulate from bore hole bottom to bore hole top in order to provide an output display of electrical resistivity versus bore hole depth.

3,899,928

ATTITUDE MEASUREMENT SYSTEM FOR SATELLITE

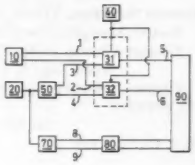
Luc F. Fraiture, Darmstadt, Germany, assignor to Organisation Europeenne de Recherches Spatiales, Neuilly-sur-Seine, France

Filed Oct. 11, 1973, Ser. No. 405,396

Claims priority, application Belgium, Mar. 29, 1973, 129421

Int. Cl. G01c *21/00*

U.S. Cl. 73—178 R 5 Claims



1. In an earth satellite stabilized by rotation about a spin axis and travelling along an earth orbit, an attitude measurement apparatus comprising a slit sun sensor having its slit in a plane containing said spin axis for providing a first signal every time said plane crosses a line satellite-sun, a magnetometer disposed substantially perpendicular to said spin axis to provide a second signal being substantially sinusouidal about an axis centered at zero and having a first positive going zero crossing and a first negative going zero crossing, said second signal representing the intensity of the magnetic field at the satellite position on said orbit, first means responsive to the first positive going zero crossing of said second signal to produce a third signal representing said positive going zero crossing, and further responsive to the first negative going zero crossing of said second signal to produce a fourth signal representing said first negative going zero crossing, and second means responsive to said first, third and fourth signals for producing a fifth signal representing the time interval between the occurence times of said first and third signals and for producing a sixth signal representing the time interval between the occurrence times of said first and fourth signals, the said fifth and sixth signals being available to be coupled to a suitable telemetering apparatus.

3,899,929

APPARATUS FOR INDICATING WIND DIRECTIONS AND VELOCITY

Jack B. Slimp, Jr., 8700 Artillery Rd., Manassas, Va. 22110

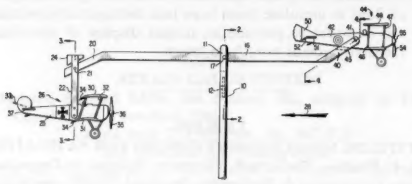
Filed Mar. 18, 1974, Ser. No. 452,219

Int. Cl. G01w *1/02*

U.S. Cl. 73—189 19 Claims

18. Apparatus which indicates the direction of the relative wind comprising support means, a bar turnably mounted on said support means whereby it is rotatable about a substantially vertical axis, and a pair of model aircraft mounted on said bar on each side of said support means, the airfoils included in said model aircraft causing said bar to be generally aligned with the relative direction of the wind at least one of said aircraft being freely pivotable at least within limits about

a horizontal connection provided in its mountings on said bar whereby the vertical angle between said bar and said airfoil of



said one aircraft is variable irrespective of said bar's position relative to the horizontal.

3,899,930

COUPLING DEVICE FOR FLUIDS AND ITS APPLICATION TO THE MEASUREMENT OF LEVELS AND THE STORAGE OF LIQUIDS

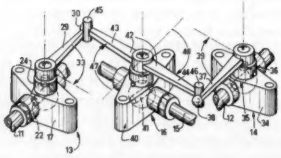
Gerard Sermanet, Yerres, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Aug. 5, 1974, Ser. No. 495,104

Claims priority, application France, Aug. 17, 1973, 73.29991

Int. Cl.[2] G01G *23/14*

U.S. Cl. 73—299 **17 Claims**



1. A coupling device for fluids, the device comprising a first conduit with a first input and a first outlet, a first isolating cock having a first operating device for opening and closing the first conduit, a second conduit with a second input and a second outlet, a second isolating cock having a second operating device for opening and closing the second conduit, a third conduit connected between said first and second conduits, a balancing cock having a third operating device for opening and closing the third conduit, and closure-preventing means comprising mobile abutment members respectively fixed on the operating devices of each of said cocks, the closure-preventing means preventing the closure of said balancing cock when at least one of said isolating cocks is closed and further preventing the closure of each said isolating cock when said balancing cock is closed,

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3,899,931

DIAL INDICATOR FOR SENSING SURFACE VARIATIONS

Shozo Iwasaki, Ebina, Japan, assignor to Kabushiki Kaisha Akashi Seisakusho, Japan

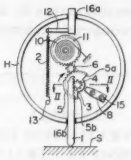
Filed Dec. 27, 1973, Ser. No. 428,871

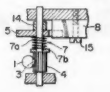
Claims priority, application Japan, Dec. 30, 1972, 48-1369

Int. Cl. F16h *19/08*

U.S. Cl. 74—34 **4 Claims**

1. An indicator comprising, a sensing spindle for sensing variations of a surface to be sensed and movable axially in opposite directions in response to variations in the surface being sensed, rotatable means responsive to the axial movement of the sensing spindle, an indicating pointer actuated angularly by said rotatable means, a slip clutch coupling the pointer to said rotatable means and having means to declutch the pointer from said rotatable means when said pointer is disposed at a reference position, an auxiliary pointer connected to said rotatable means continuously movable in response to the axial movement of said sensing spindle and movable proportionately to said axial movement for establish-





ing and indicating a reference sensing axial position of said sensing spindle from which indicated sensing of said sensing spindle is indicated by said indicating pointer, means biasing said spindle in a direction for sensing said surface, and said indicating pointer indicating a variation of said sensing spindle from said reference position thereof.

3,899,932

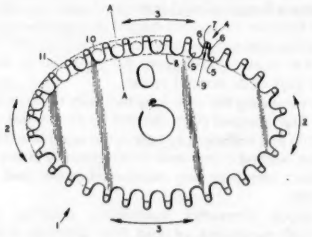
CHAIN RETENTION DEVICE FOR ELLIPTICAL SPROCKETS

Roger Owen Durham, 3944 Marathon St., Los Angeles, Calif. 90029

Filed Dec. 19, 1973, Ser. No. 425,991

Int. Cl.[2] F16H *55/30, 55/04*

U.S. Cl. 74—243 NC **6 Claims**



1. A non-round sprocket having tips and flat sides wherein the teeth along the flat sides are of greater height than those at the tips.

3,899,933

TRANSMISSION WITH ANTIBACKLASH MEANS

Dexter V. Wright, Pittsburgh, Pa., and John M. Hague, III, Buffalo, N.Y., assignors to White-Westinghouse Corporation, Cleveland, Ohio

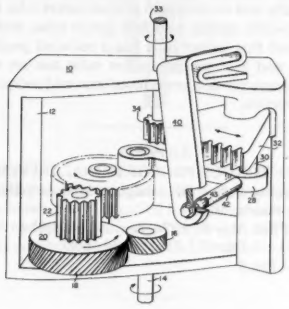
Filed Jan. 2, 1974, Ser. No. 430,108

Int. Cl.[2] F16H *55/18*

U.S. Cl. 74—440 **8 Claims**

1. Antibacklash means for transmission having support structure for mounting a rotating input shaft and an output means for driving a relatively high-inertia load, said output

means having a repetitive cyclical movement defining opposed extreme positions and means also mounted on said support structure for providing positive driving engagement between said input shaft and said output means, said engagement means including a rotatively driven crank gear coupled to said input shaft for a driving force therebetween and a connecting rod rotationally connected at one end to said crank gear, the opposed end of said connecting rod pivotally coupled to said output means, and wherein said antibacklash means comprises:



means including a yieldable member for applying a rotational force to said crank gear, the direction and magnitude of said rotational force being related to the relative position of said output means in said output cycle such that at least during the portion of the output cycle in which said output means is in or adjacent either said extreme positions, said rotational force is greater in magnitude than the inertial force transmitted to the crank gear by said load and in a direction opposing the direction of rotation of said crank gear, whereby, the crank gear is maintained free of torque reversals caused by the inertia of said load.

3,899,934

CONTROL DEVICE FOR A GEARBOX OF A VEHICLE

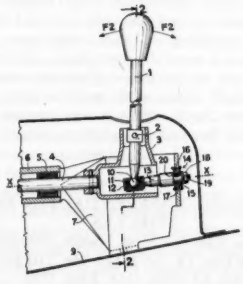
Armand Froumajou, Pontoise, France, assignor to Automobiles Peugeot, Paris and Regie Nationale des Usines Renault, Boulogne-Billancourt, both of, France

Filed Feb. 4, 1974, Ser. No. 439,283

Claims priority, application France, Feb. 8, 1973, 73.04455

Int. Cl.[2] G05G *9/02*

U.S. Cl. 74—471 XY **6 Claims**



1. A control device for a gearbox for a vehicle comprising means defining a support for securing to the floor of the vehicle, a control shaft rotatable and slidable about and along a fixed axis relative to the support, a cage integral with or attached to the control shaft, a manually-shiftable gear lever pivoted to the cage, a ball joint substantially centered on said axis and having a male part and a female part, and a member connected to the support to be capable of a limited pivoting movement relative to the support and carrying the female part of the ball joint, the lever carrying the male part of the ball joint, the female part of the ball joint being a bushing in which the male part is engaged without clearance.

3,899,935

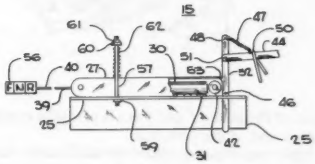
TRANSMISSION CONTROL APPARATUS FOR A VEHICLE OR THE LIKE

Overton Jackson Jiles, 5250 Auburn Folsom Rd., Loomis, Calif. 95650

Filed Dec. 28, 1973, Ser. No. 429,190

Int. Cl.[2] B60K *20/00;* **B60R** *21/02*

U.S. Cl. 74—473 R **13 Claims**



1. Transmission control apparatus for the transmission of a vehicle or the like wherein said transmission is movable between gears and includes transmission control means for controlling said movement, said apparatus comprising:

a sensor bar pivotally connected to said vehicle and movable inwardly toward said vehicle;

cylinder housing means mounted on said vehicle, and housing a cylinder therein, said cylinder having a piston slideably mounted therein, wherein said housing means includes a bracket fixedly secured to said vehicle and a first housing fixedly secured to said bracket and a second housing telescopingly fitting with said first housing and pivotally connected thereto forming an elongated channel therebetween, said cylinder being mounted in said channel,

said cylinder also having piston biasing means therein normally biasing said piston in a direction away from said transmission control means;

transmission movement means operatively connected to both said piston and said transmission control means for moving said transmission control means between its gears upon release of said piston from its normally biased position; and

piston releasing means associated with both said housing means and said bar for releasing said piston from its normally biased position upon movement of said sensor bar.

3,899,936

MECHANICAL LINKAGE

Geoffrey Arthur Lewis, Solihull, England, assignor to Lucas Aerospace Limited, Birmingham, England

Filed Apr. 8, 1974, Ser. No. 458,896

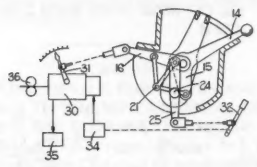
Claims priority, application United Kingdom, May 3, 1973, 21025/73

Int. Cl.[2] G05G *11/00*

U.S. Cl. 74—479 **9 Claims**

1. A mechanical linkage comprising a carrier, a first input member pivotally supported on said carrier, an output member supported on said carrier for movement about the pivotal axis of said first input member, six links of substantially equal effective lengths, arranged as follows:

a. one end of a first one of said links is secured to said first input member for movement about the pivotal axis thereof,
b. a second one of said links is mounted at one end thereof for pivotal movement about the axis of said first input member,
c. said second link is drivingly engaged with said output member,
d. one end of each of the third, fourth and fifth ones of said links are pivotally interconnected,
e. the other ends of the third and fourth links are respectively pivotally connected to the other ends of said first and second links,



f. one end of the sixth of said links is pivotally connected to the other end of the fifth link,

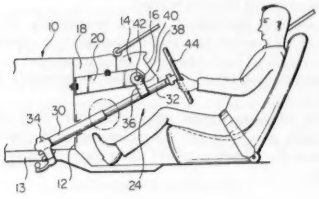
a second input member supported on said carrier for pivotal movement about an axis parallel to the pivotal axis of the first input member, and spaced therefrom by the effective length of one of said links, the other end of said sixth link being secured to said second input member, a support structure upon which said carrier is mounted for pivotal movement about an axis which is aligned with the pivotal axis of said second input member, and means for interengaging said first input member and said carrier in a fixed relative position.

3,899,937

COLLAPSIBLE STEERING COLUMN ASSEMBLY

Yasuo Nagazumi, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed July 13, 1973, Ser. No. 378,872
Claims priority, application Japan, July 14, 1972, 47-69994
Int. Cl. B62d *1/18*
U.S. Cl. 74—492 **2 Claims**



1. In a vehicle,

a steering gear assembly;

a collapsible frame member having mounted thereon said steering gear assembly, said collapsible frame member being so constructed and arranged that during the initial stage of a frontal collision of the vehicle it deforms and causes said steering gear assembly to displace rearwardly of the vehicle;

a collapsible steering column having first and second jacket tubes, said first jacket tube being connected to said steering gear assembly and said second jacket tube being telescopically related to said first jacket tube;

means for supporting said second jacket tube from another frame member of the vehicle in a manner permitting telescopic movement against said first jacket tube but preventing movement away from said first jacket tube;

said first and second jacket tubes being so constructed and telescopically connected with each other, such that when said steering gear assembly is displaced rearwardly of the vehicle by deformation of said collapsible frame member during the initial stage of a frontal collision of the vehicle, application of an axial load by said steering gear assembly to said first jacket tube tending to urge said first jacket tube against said second jacket tube causes said first jacket tube to telescopically move relative to said second jacket tube and renders said second jacket tube telescopically movable against said first jacket tube, and

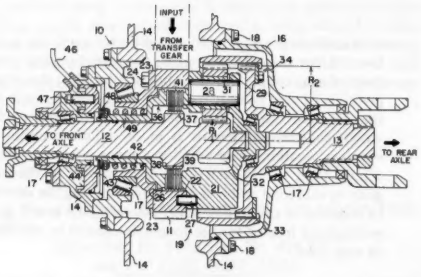
wherein said first jacket tube has a reduced profile sleeve portion and said second jacket tube has an expanded profile sleeve portion press fitted into said reduced profile sleeve portion.

3,899,938

PLANETARY TORQUE PROPORTIONAL DIFFERENTIAL

Elmer R. Crabb, Pekin, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed May 8, 1974, Ser. No. 468,014
Int. Cl.[2] F16H *1/44, 1/42*
U.S. Cl. 74—710.5 **9 Claims**



1. A torque transfer system for a vehicle having first and second drive axles comprising; first output shaft means for transmitting drive torque to said first axle, second output shaft means for transmitting drive torque to said second axle, said second output shaft means being disposed coaxially with respect to said first output shaft means, first input means for transmitting torque from an external source to said torque transfer system, differential gear means for selectively transmitting torque to said first and second output shaft means to normally concurrently rotate each of said output shaft means at a different angular speed, manually actuated clutch means for selectively overriding said differential gear means and locking said first and second output shaft means together for concurrent rotation of said first output shaft means and said second output shaft means at the same angular speed, said manually actuated clutch means, when actuated, permitting the rotation of said first and second drive axles of said vehicle.

3,899,939

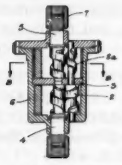
SELF-LOCKING DIFFERENTIAL FOR MOTOR VEHICLES

Alfonso Hilado, P.O. Box 3130, Manila, Philippines

Filed Dec. 18, 1972, Ser. No. 316,241
Int. Cl. F16h *1/38;* F16h *1/20*
U.S. Cl. 74—715 **5 Claims**

1. In a differential mechanism, a rotatable gearing box or carrier, drivable members extending from opposite ends of said carrier, a worm element splined to each member respectively and lying within said carrier, each worm element abutting with the opposite element having spiral threads thereon,

mating planetary worm of two portions with different diameters journaled in said carrier, a corresponding identical planetary worm oppositely positioned and meshing with it and each planetary worm meshing with the corresponding worm element, one portion of a planetary worm being left handed and

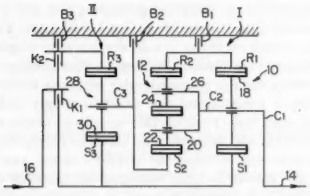


the other portion right handed, and one worm element slightly larger in diameter than is called for by the ratio of revolutions between it and the meshing planetary worm, the whole mechanism being constrained from moving longitudinally along their axes.

3,899,940
CHANGE-SPEED TRANSMISSION FOR PASSENGER AUTOMOBILE

Tetsuya Iijima, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed June 18, 1974, Ser. No. 480,471
Claims priority, application Japan, June 29, 1973, 48-72863
Int. Cl.² F16H *57/10*
U.S. Cl. 74—759 **5 Claims**

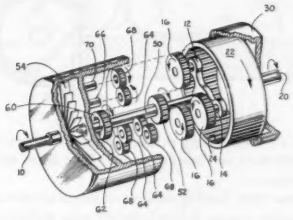


1. A change-speed transmission for a passenger automobile, comprising a first planetary gear train group having a basic planetary gear unit, the carrier of which serves as an output, the sun wheel of which is connectable to an input by a first clutch, and the annular wheel of which is brakeable by a first brake; and a dual-pinions planetary gear unit, the carrier of which is connected to the carrier of said basic planetary gear unit of said first planetary gear train group for simultaneous rotation therewith, the sun wheel of which is brakeable by a second brake; and a second planetary gear train group having a second basic planetary gear unit, the annular wheel of which is connectable to the input by a second clutch and brakeable by a third brake, the carrier of which is connected to the sun wheel of the dual-pinions planetary gear unit of said first planetary gear train group and is brakeable by the second brake, and the sun wheel of which is connected to the sun wheel of the basic planetary gear unit of said first planetary gear train group and is connectable by the first clutch to the input.

3,899,941
CONTINUOUSLY-VARIABLE-GEAR-RATIO AUTOMATIC TRANSMISSION

John F. Cook, 810 E. Brown Deer Rd., Milwaukee, Wis. 53217

Filed Jan. 2, 1974, Ser. No. 430,156
Int. Cl. F16h *57/10, 3/74*
U.S. Cl. 74—781 R **10 Claims**



1. An automatic continuously-variable-gear-ratio transmission comprising:

a. input shaft means (**10**) having an orbital gear carrier means (**12**) fixed thereto;

b. orbital gear means (**14,16**) carried by the orbital gear carrier means (**12**);

c. intermediate shaft means including an intermediate shaft (**50**) having intermediate driven gear means (**52**) fixed thereto;

d. said intermediate driven gear means (**52**) being driven by the orbital gear means (**16**);

e. torque means (**54**) connected to the intermediate shaft means for resisting rotation of the intermediate shaft (50);

f. output gear means (**22**) engaging the orbital gear means (**16**);

g. output shaft means (**20**) driven by the output gear means (**22**);

h. gear train means including an intermediate drive gear (60) drivable by the intermediate shaft (**50**) and one way drive means (**62**); and whereby

i. said gear train means (**60**) being driven by the intermediate shaft (**50**) and driving the output gear means (**22**) when the one way drive means (**62**) is engaged.

5. An automatically continuously variable gear ratio transmission comprising:

a. an input shaft means (**10**) having an orbital gear carrier means (**12**) fixed thereto;

b. orbital gear means (**14,16**) carried by the orbital gear carrier means (**12**);

c. intermediate shaft means including an intermediate shaft (**50**) having intermediate driven gear means (**52**) fixed thereto;

d. said intermediate driven gear means (**52**) being driven by the orbital gear means (**16**);

e. intermediate drive gear means including intermediate drive gear (**81**) coupled to the intermediate shaft (**50**);

f. torque means (**54**) fixed to the intermediate shaft means for resisting rotation of the intermediate shaft (**50**);

g. gear train means (**82–88**) engaging the intermediate drive gear (**81**);

h. output ring gear means (**22**) engaging the orbital gear means (**16**) and the gear train means (**82–88**);

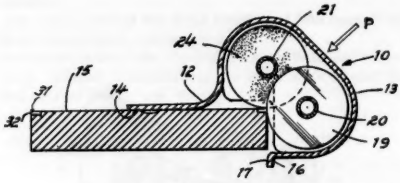
i. one way drive means (**86** or **98**) for allowing said intermediate shaft (**50**) to rotate in only one direction; and,

j. an output shaft (**20**) fixed to the output ring gear (**22**).

3,899,942
SKI EDGE SHARPENER

Wilburn F. Bradbury, 1234 Ridgewood Dr., Northbrook, Cook, Ill. 60062

Filed June 14, 1974, Ser. No. 479,432
Int. Cl.[2] B21K 17/00
U.S. Cl. 76—89 7 Claims



1. A tool for sharpening metallic edge members marginally bordering the bottom running surface of a snow ski comprising in combination:

A. a hollow body having elongated guide means adapted to operatively engage the bottom running surface of the ski;

B. first and second shafts mounted parallel in said body, the axes of which parallel said edge member in the operating position of the tool;

C. at least one cutting disk mounted on the first of said shafts, said shaft having its axis in the plane of the bottom running surface of the ski;

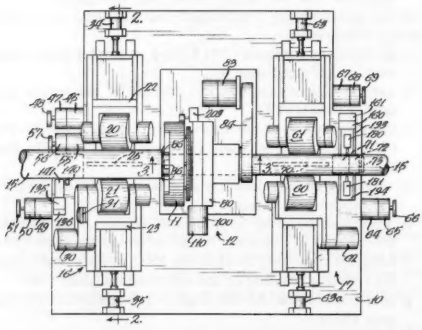
D. at least one abrasive wheel mounted on the second shaft having its axis spaced above the plane of the bottom running surface of the ski a distance of one-half the diameter of said abrasive wheel;

E. the peripheries of said cutting disk and said abrasive wheel overlappingly intersect to provide tangential engagement with opposing intersecting surfaces of said edge member, whereby, to-and-from motion of the tool longitudinally of said ski simultaneously shaves the side surface and abrades the bottom surface of said edge member to form a sharp snow engaging corner at the intersection thereof.

3,899,943
HIGH SPEED BAR PEELER

Robert L. Schaller, Baldwinsville, N.Y., assignor to Sundstrand Syracuse, Inc., Syracuse, N.Y.

Filed Feb. 4, 1974, Ser. No. 439,250
Int. Cl.[2] B23D 5/12
U.S. Cl. 82—20 5 Claims

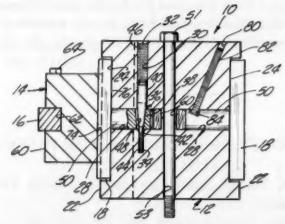


1. A bar peeler positionable in a process line for removing material from a bar rotating at a high speed comprising, a frame having a cutting station, a bar feed-in station in advance of said cutting station, a bar feed-out station beyond said cutting station, means at each of the last two stations for rotating and linearly advancing a bar, a tubular cutting head at the cutting station having a central passage through which the bar travels and a plurality of cutting tools for travel circumferentially of the bar, means for rotating said cutting head about an axis concentric with said bar and in the same direction as bar rotation, means for setting said cutting tools to machine the bar to a predetermined diameter, means for gaging bar diameter after cutting, means responsive to the gaging means determining a size variation in the bar for adjusting the cutting tools, and means for maintaining a pre-set relative speed between said bar and cutting tools.

3,899,944
TOOLPOST STRUCTURE

Hank Frechtling, 236-2 Prescott, E. Quad Hall, 701 E. University, Ann Arbor, Mich. 48104

Filed Mar. 12, 1974, Ser. No. 450,301
Int. Cl. B23b 29/00
U.S. Cl. 82—36 4 Claims



1. A toolpost structure for a lathe or the like, said toolpost structure comprising a block having a generally rectangularly shaped cross section with four perpendicular outer working surfaces, one of the lengthwise corners of said block having a longitudinal slot through which one end of a horizontally disposed bore opens;

a coupling member comprising a base plate and a laterally disposed plunger extending from said base plate, said plunger being received in said horizontally disposed bore and adapted for limited movement therewithin;

a tool holder having perpendicular working surfaces separated by a longitudinal slot sized to snugly and slidably receive said base plate of said coupling member;

clamping means in said toolpost block movable for engagement with said plunger to laterally move said plunger inwardly and draw said working surfaces of said tool holder into an abutting contact with the two adjacent working surfaces of said toolpost block, said clamping means for moving said plunger inwardly into said toolpost block comprising first and second axially aligned vertically disposed bores intersecting said horizontally disposed bore and respectively disposed above and below said horizontal bore;

said plunger having a tapered bore and positionable between said first and second bores when said plunger is within said horizontal bore;

a clamping pin movable within said first and second bores and having a tapered surface complementary to said plunger tapered bore and means for moving said tapered clamping pin inwardly to engage the wall of said plunger tapered bore to exert a force on said plunger to move the same laterally inwardly into said horizontal bore;

said first bore disposed above said horizontal bore having a cross-sectional area greater than said second bore, said tapered pin having an upper portion slidably disposed in said first bore and a lower portion of a smaller cross-sectional area which is slidably disposed in said second bore, said tapered clamping pin engaging said tapered bore of said plunger while said upper and lower portions are

respectively engaged with said first and second bores and laterally supported thereby;

a threaded member engaging said first bore and abutting the upper portion of said clamping pin for moving said clamping pin toward said second bore; and

spring means disposed in said second bore for restraining said downward movement of said pin and for urging said clamping pin upwardly toward said first bore when said threaded member is moved away from said plunger

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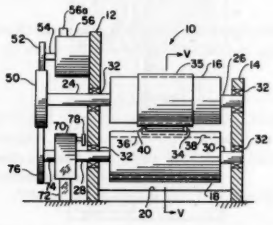
3,899,945
METHOD AND APPARATUS FOR ACCURATE DIE-CUTTING

Clyde Barner Garrett, Lanham, and William Stansbury Thayer, Lutherville, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Division of Ser. No. 319,163, Dec. 29, 1972. This application Nov. 1, 1973, Ser. No. 411,941

Int. Cl.[2] B23D *25/12;* **B26D** *1/56*

U.S. Cl. 83—38 **16 Claims**



1. A method of controlling the accuracy of cuts made in a paperboard blank passing between a pair of cooperating die and anvil cylinders comprising the steps of:

driving said die cylinder at a first angular velocity;

driving said anvil cylinder at a second angular velocity; and

selectively changing and maintaining said second angular velocity equal to, faster, or slower than said first angular velocity,

for controlling the velocity of said blank.

3,899,946
DEVICE FOR THE PRINT-REFERENCED CUTTING OF A PRINTED WEB

Otto Niepmann, Gevelsberg, Germany, assignor to Maschinenfabrik Fr. Niepmann & Co., Gevelsberg, Germany

Filed July 26, 1974, Ser. No. 492,205

Claims priority, application Germany, July 27, 1973, 2338109

Int. Cl. B65h *25/10*

U.S. Cl. 83—75 **14 Claims**

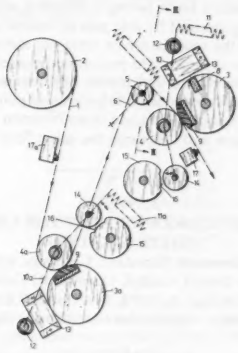
1. In an apparatus for cutting a continuous web, having regularly spaced printed patterns or other readable markings thereon, into a series of blanks whose cuts are positioned substantially at the same distance with reference to the printed pattern, regardless of cumulative deviations in the web advance and/or in the pattern spacing on the web, a device for varying the web advance per cutting cycle in reference to the position of the printed pattern on the web, the device comprising in combination:

a pair of web advancing rollers, engaging the printed web from opposite sides, one roller being a feed drum, rotating at constant speed, the other roller serving as a counter roller;

a radially oriented cutting knife on the periphery of the feed drum, cutting the web once during each drum revolution so as to obtain, with each cut, a printed blank of a length corresponding to the circumference of the feed drum;

a deformable circumference portion on the feed drum defined by a radially depressible member of the feed drum; a circumference on the feed drum with, in the absence of deformation of said circumference portion, advances a blank length which is slightly less than the distance at which the printed patterns are spaced on the web;

means for forcibly approaching the counter roller against the feed drum during that angle of drum revolution in which the roller faces the deformable circumference portion of the drum, thereby depressing said member of the drum and temporarily increasing its effective circumference, so as to advance a blank length which is longer than that which would be advanced without such depression; and



means for selectively controlling the approaching means to execute, or not to execute, said approach motion during any given drum revolution, in response to the position of the printed pattern on the web in relation to the angular position of the cutting knife on the drum.

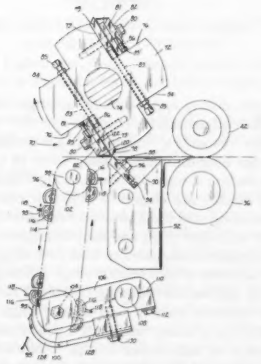
3,899,947
AUXILIARY TRIM-OUT UNIT FOR PRINTED WEBS

Hans G. Faltin, York, Pa., assignor to Advance Enterprises, Inc., York, Pa.

Filed July 29, 1974, Ser. No. 492,398

Int. Cl.[2] B26D *7/18, 1/56;* **B41F** *13/56*

U.S. Cl. 83—113 **14 Claims**



1. An auxiliary trim-out unit adapted to receive from a web printing press a longitudinally folded or unfolded web comprising a series of similar pre-printed pieces having short lengths of excess waste web material between the opposite

ends of successive pieces which must be trimmed therefrom, said trim-out unit comprising in combination, a frame, a pair of feed rolls supported by said frame, means connected to said rolls and adapted to drive the same at press speed, a rotary knife holder supported and driven by a shaft rotatable in bearings upon said frame, at least one pair of cutting and trimming knives having shearing edges extending across said holder substantially between the opposite ends thereof and spaced circumferentially of said holder a distance equal to the length of the strip of web to be trimmed out from between successive pre-printed pieces, a stationary bed knife supported by said frame and extending across the path of said web, said stationary knife having a shearing edge positioned for shearing engagement by said pair of knives on said rotary knife holder as the same is driven rotatably simultaneously to cut said webs to separate said pre-printed pieces and trim the excess strips therefrom, and means adjacent said stationary knife operable to remove from between said pair of knives the waste strips of the web trimmed from between said adjacent pre-printed pieces and discharge the same from said unit.

3,899,948
ADJUSTMENT ARRANGEMENT FOR CIRCULAR SLITTING KNIVES

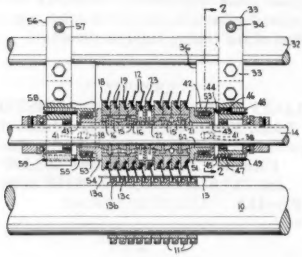
Hans Jakob, Darmstadt-Eberstadt, Germany, assignor to Maschinenfabrik Goebel, GmbH, Darmstadt, Germany

Filed Apr. 8, 1974, Ser. No. 459,174

Claims priority, application Germany, Apr. 6, 1973, 2317215

Int. Cl.² B26D 1/24

U.S. Cl. 83—497 **5 Claims**



1. In a web slitting apparatus, an arrangement for the uniform angular adjustment of upper circular cutting blades against their respective lower cutting blades cooperating therewith, for longitudinally cutting webs of paper, foil, and the like, including a rotatable shaft along which a plurality of said upper blades are disposed adjacent one another, first rings surrounding said shaft, second rings surrounding respective ones of said first rings and supporting said upper blades, the outer peripheral surfaces of said first rings and the inner peripheral surfaces of said second rings defining mating spherical surfaces, sleeves surrounding said shaft respectively bearing against opposite ends of said second rings, and means for moving said sleeve along said shaft a predetermined amount, whereby each of said upper blades is likewise moved with respect to said shaft by substantially the same amount as said second rings shift relative to said first rings along said mating spherical surfaces thereof, to thereby uniformly adjust the angularity of said upper blades bearing against their cooperating lower blades.

3,899,949
APPARATUS FOR AUTOMATICALLY CUTTING GARMENTS

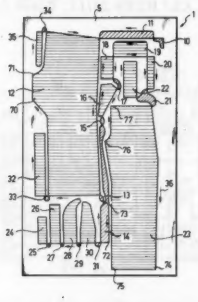
Bruno Bystron, Ingolstadt; W. Gerhard Hoeber, Ingolstadt-Oberhaunstadt, and Georg Goldammer, Ingolstadt-Friedrichshofen, all of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany

Filed Sept. 28, 1973, Ser. No. 401,658

Claims priority, application Germany, Sept. 30, 1972, 2248043

Int. Cl. D06h 7/24

U.S. Cl. 83—565 **17 Claims**



1. Apparatus for automatically controlling a garment component cutting device having drive means, the apparatus including a program carrier bearing a pattern layout defining a sensing line, means for sensing the sensing line and for operating the cutting device drive means for cutting garment components from flat material, the pattern layout having pattern components, including pattern pieces, having peripheries defining sensing lines forming an endless sensing line to be sensed by the sensing means, the improvement comprising each pattern component having at least one peripheral salient angle, the pattern components being laid out with adjoining components being joined at the apexes of salient angles, the sides of each joining salient angle forming substantially continuous crossing sensing lines with the sides of its adjoining salient angle.

3,899,950
BAR SHEAR

Jim Dvorak, Cosmos, Minn. 56228

Filed Sept. 6, 1974, Ser. No. 503,966

Int. Cl.² B26D 5/08, 9/00

U.S. Cl. 83—588 **11 Claims**

1. A bar shear including:

a slide plate having a notch in one side thereof,

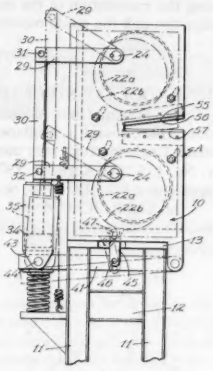
a moveable plate having a cooperable notch in one side thereof registrable with said notch in said side plate in one position thereof,

said moveable plate having a circular aperture extending therein,

a disc pivotally moveable in said aperture,

a pivot shaft fixed on said disc offset from the center thereof and extending through said side plate,

means for pivoting said pivot to move said moveable plate relative to said fixed plate and to move the notch in said



moveable plate out of registry with said notch in said side plate to shear off a member inserted in said notch.

3,899,951

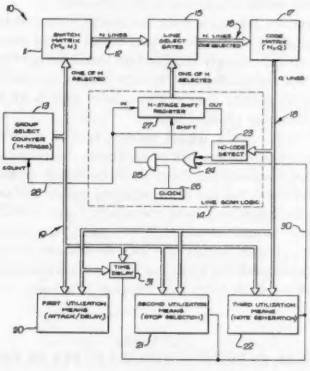
KEY SWITCH SCANNING AND ENCODING SYSTEM

Glen R. Griffith, Westminster, and Ralph Deutsch, Sherman Oaks, both of Calif., assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Aug. 9, 1973, Ser. No. 386,968

Int. Cl. G10h *1/00*

U.S. Cl. 84—1.01 **4 Claims**



1. A switch scanning and encoding system in an electronic musical instrument, said instrument including a plurality of key-controlled switches arranged in a matrix of M columns and N rows, each column of switches being separately enableable, the switches in each row being connected to N corresponding row output lines, and musical tone generation circuitry responsive to said encoded signals, the improvement comprising:

encoding circuitry,

scanning means for sequentially gating each of said N output lines to said encoding circuitry, said encoding circuitry providing a coded signal identifying the gated line if the switch in the enabled matrix column connected to that gated line is closed and providing no coded signal if that switch is open,

first skip means for causing said scanning means to gate the next output line to said encoding circuitry if no coded signal is provided, and

second skip means, operative if a coded signal is provided from said encoding circuitry, for causing said scanning means to dwell for a period of time sufficient to permit utilization of said coded signal.

3,899,952

ADAPTOR FOR COMMON PIANOS

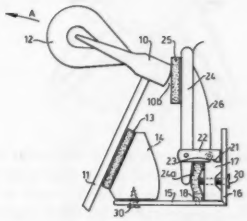
Lance Regan, 191 Vernon Ave., Kamloops, British Columbia, Canada

Filed June 20, 1974, Ser. No. 481,316

Claims priority, application Canada, Mar. 11, 1974, 194611

Int. Cl. G10c *3/18*

U.S. Cl. 84—236 **16 Claims**



1. A musical instrument comprising a plurality of vibratile members capable of vibration to produce notes of selected frequencies, percussive means for each said vibratile member for causing vibration thereof, actuating means for selectively moving each said percussive means from a rest position, to strike a vibratile member associated therewith, return means for returning said percussive means to said rest position, a stop member for said percussive means in said rest position, and a control mechanism for said percussive means including inertial means movable in the direction of motion of said percussive means towards said stop member and active upon said percussive means when struck thereby to absorb the kinetic energy of said percussive means moving towards said stop member and thereby exert a decelerative force upon said percussive means said stop member having a surface of resiliently deformable material which said percussive means abuts in said rest position thereof, and said inertial means being located for striking by said percussive means moving towards said stop member substantially at the moment of initial contact of said percussive means with said resiliently deformable material.

3,899,953

SELF-PROPELLED FIN STABILIZED PROJECTILES AND LAUNCHERS THEREFOR

Jean Edmond Labruyere, Paris, France, assignor to Constructions Navales et Industrielles de la Mediterranee (C.N.I.M.), Paris, France

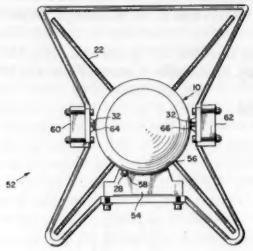
Continuation-in-part of Ser. No. 236,612, March 21, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,241

Int. Cl. F41f *7/00*

U.S. Cl. 89—1.819 **14 Claims**

1. A self-propelled, fin stabilized projectile comprising an elongated, generally cylindrical projectile body, a plurality of rigid first studs symmetrically spaced about the periphery of said body, the proximate end of said first studs being directly affixed to said body to prevent relative movement between said first studs and said body, said first studs having a first length in the radial direction of said body such that the distal end of said first studs is adjacent to said body, a fin unit including a plurality of fins symmetrically spaced about the periphery of said body and extending outwardly therefrom such that the distal end of said fins is remote from said body, said fin unit being mounted on said body for rotational movement relative to said body about the longitudinal axis of said body and having a plurality of rigid second studs symmetrically

spaced about the periphery of said body, said second studs having a second length in the radial direction of said body such that the distal end of said second studs is adjacent to said body and a plurality of rigid third studs symmetrically spaced about the periphery of said body and mounted for rotational movement relative to said body about said longitudinal axis,



said third studs having a third length in the radial direction of said body such that the distal end of said third studs is adjacent to said body, said fins having a fourth length in the radial direction of said body measured to the distal end of said fins, said fourth length being significantly greater than said first, second and third lengths.

3,899,954

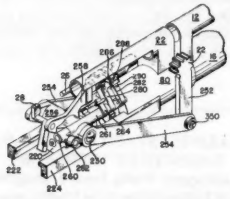
EMPTY CARTRIDGE FORWARD EJECTION MECHANISM FOR RAPID FIRE WEAPON

Laurence I. Jayne, Renton, and Roland A. Magnuson, Seattle, both of Wash., assignors to Pacific Car and Foundry Company, Bellevue, Wash.

Division of Ser. No. 377,322, July 9, 1973, which is a division of Ser. No. 185,139, Sept. 30, 1971, abandoned. This application Jan. 16, 1974, Ser. No. 433,745

Int. Cl. F41d *9/02*

U.S. Cl. 89—33 F **4 Claims**



1. An empty cartridge ejection system for a weapon wherein the empty cartridge is ejected forwardly from the weapon, comprising:

a barrel;

a breech affixed to the rear end of the barrel;

a bolt containing a firing pin and adapted to move in axial alignment with the barrel;

a grasping arm pivotally attached to the bolt and adapted to secure the empty cartridge;

means for moving the bolt forward and backward in axial alignment with the barrel;

means for pivoting the grasping arm to a first position to secure the empty cartridge and for pivoting the grasping arm to a second position which is radially outward from the breech;

guide means in axial alignment with the empty cartridge when the grasping arm is in its second position; and

means for releasing the empty cartridge from the grasping arm at a predetermined point when the grasping arm is in its second position and moving forward with the bolt, thereby allowing the momentum of the cartridge to propel the cartridge through the guide means.

3,899,955

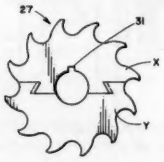
MACHINE TOOL CONSTRUCTION

Howard I. Selch, Canal Fulton, Ohio, assignor to James I. Selch, Canal Fulton, Ohio; Joseph J. Mullane, Denver, Colo. and T. D. Copeland, Garland, Tex., part interest to each

Division of Ser. No. 135,706, April 20, 1971, Pat. No. 3,799,026. This application Feb. 22, 1974, Ser. No. 444,861

Int. Cl.[2] B23C *5/26*

U.S. Cl. 90—11 A **4 Claims**



1. In a machine tool comprising:

a drive shaft being partially threaded and having a reduced diameter at the ends thereof and said ends being received in support bearings for rotation of said shaft;

cutter wheel means having a circular central bore for being received on said drive shaft,

means between the cutter wheel means and the shaft to prevent relative rotation therebetween;

spacer means having a smooth central bore and located on said shaft at each side of said cutter wheel means;

nut means threadingly received on threaded portions of said shaft for tightening said spacer means against the cutter wheel to secure said cutter wheel means at a selected axial location on said shaft;

each of said cutter wheel means, spacer means and nut means comprising a pair of separable members located on opposite sides of the drive shaft, each pair of said separable members having interengaging means for connecting and disconnecting said members from each other by relative lateral movement, whereby the cutter wheel means, spacer means and nut means are mountable on said drive shaft for a cutting operation without removal of said drive shaft from said support bearings.

3,899,956

LINEAR ELECTROHYDRAULIC PULSE DRIVE ACTUATOR

Zenny Olsen, Southington, Conn., assignor to Olsen Controls, Inc., Plantsville, Conn.

Filed Nov. 5, 1973, Ser. No. 412,634

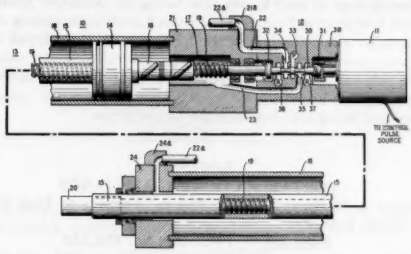
Int. Cl. F15b *9/10*

U.S. Cl. 91—368 **3 Claims**

1. An electrohydraulic pulse drive actuator comprising in combination an electrical stepping motor having an output shaft, a servo valve having a rotary input shaft and a rotary feedback shaft, means connecting the output shaft of said motor to the input shaft of said valve, a hydraulic actuator controlled by said valve, said actuator comprising a cylinder and a piston moveable therein, means for integrating said actuator and said valve into a unitary housing, and

feedback means within said housing and operating therein for providing feedback control from said actuator to the feedback shaft of said valve, said feedback means comprising a ball-screw drive for translating linear movement of said pistion into rotary movement of said feedback

shaft, said ball-screw drive comprising a ball carrier secured to said piston and a screw connected to said feedback shaft and wherein said ball carrier comprises two



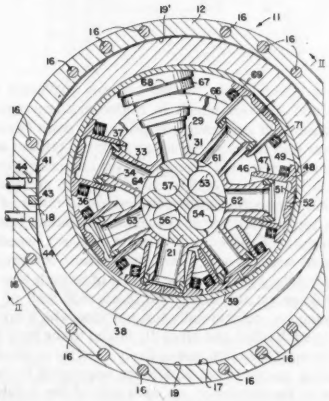
ball nuts, loading means for loading one ball nut against the other on said screw to reduce backlash and adjusting means for continuously and automatically adjusting said loading to compensate for bearing wear.

3,899,957

RADIAL PISTON FLUID TRANSLATING DEVICE WITH CYLINDER POSITIONING MEANS

Guy C. Carlson, Jr., East Peoria, and Willard J. Haak, Peoria, both of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Oct. 23, 1973, Ser. No. 408,823
Int. Cl.[2] F01B *13/06*
U.S. Cl. 91—490 **5 Claims**



1. In a fluid translating device, the combination comprising:

an annular race;

a rotor journaled for rotation within said race about an axis which is eccentric relative thereto, said rotor having hollow piston spokes extending radially towards the inner surface of said race and having means for admitting fluid to said spokes during a first portion of the angular movement thereof and for releasing fluid from said spokes during another portion of the angular movement thereof;

a plurality of cylinders each having an open inner end into which an associated one of said spokes is received and having an outer end which rides against said inner surface of said race as said rotor turns, said outer ends of said cylinders having flanges thereon,

a guide ring disposed coaxially within said race in radially spaced relationship therefrom, and

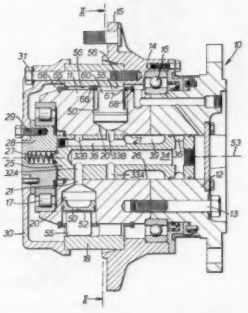
resilient means for urging each of said cylinders outwardly from the rotational axis of said rotor and towards said inner surface of said race, said resilient, means being disposed between said flanges and said guide ring to act against said flanges and to react against said guide ring.

3,899,958

FLUID-PRESSURE ROTARY MACHINES

Kenneth Morgan Spencer, Coventry, England, assignor to Newage Engineers Limited, Lincolnshire, England

Filed Aug. 15, 1973, Ser. No. 388,622
Claims priority, application United Kingdom, Aug. 16, 1972, 38265/72; Aug. 16, 1972, 38264/72
Int. Cl. F01b *13/06*
U.S. Cl. 91—492 **5 Claims**



1. A rotary hydrostatic-pressure piston machine comprising a cylinder block and an annular cam track surrounding the cylinder block, one of which is rotatable relatively to the other, and reciprocating pistons slidable in generally radial directions in cooperating cylinders in the block and coacting with the cam track, in which each piston carries at its outer end a generally cylindrical cam follower roller rotatably housed in a bearing recess in the outer end of the associated piston in rolling engagement with the surrounding cam track, said cylinders and their associated pistons and follower rollers being arranged in two axially spaced banks in the cylinder block,

means for providing positive endwise location for each of said rollers, said means comprising a pair of axially spaced guide rings which coaxially surround said cylinder block and are freely rotatable thereon, and a third guide ring freely rotatable on said cylinder block, said third guide ring being disposed between said axially sapced pluralities of rollers and said pair of rings being positioned on either side of said rollers and third guide ring arrangement, and

means for axially retaining said guide rings on said block, said means comprising a pair of spring circlips disposed outside of said pair of guide rings on either side of said rollers and third guide ring arrangement, whereby said rollers and said third ring axially retain each other.

3,899,959

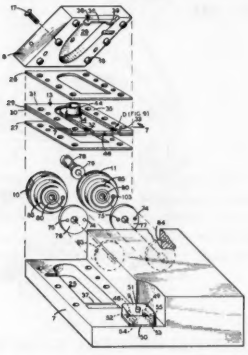
PNEUMATIC CONTROLLERS

Pierre Bertrand, Billere, and Maurice Nony, Jouy-En-Josas, both of France, assignors to Compteurs Schlumberger, Montrouge, France

Division of Ser. No. 270,120, July 10, 1972. This application Dec. 18, 1973, Ser. No. 425,869
Claims priority, application France, July 12, 1971, 71.25472
Int. Cl. F01b *19/00*; **F16j** *3/00*
U.S. Cl. 92—100 **1 Claim**

1. In a pneumatic controller of the type having a split housing and a beam structure wherein the individual portions of housing include means defining two cavities separated by

inwardly protruding wall member having an edge which extends along the pivot axis of the beam, and fastener means extending through openings in the housing portions for clamping the portions thereof together, and wherein the beam structure includes a flexible diaphragm clamped between the portions of the split housing and separating it into four chambers, metal plates having outer and inner plate portions adjacent said diaphragm to render portions thereof substantially inflexible, and narrow bridge portions adjacent said edge to interconnect said outer and inner plate portions along the pivot axis, the improvements comprising thinned portions in said narrow bridge portions, in a dimention perpendicular to the



major plane of the diaphragm to improve the hinge characteristics thereof; and

a plurality of bosses on the surface of one of said housing portions facing the other housing portion, said beam structure having a plurality of openings and the surface of said other housing portion facing said surface of said one housing portion having a plurality of recesses, said bosses respectively protruding and mating said openings and said recesses when said pneumatic controller is assembled and the height of said bosses and the depth of said recesses being adapted to limit the crushing of said diaphragm, improving said hinge characteristics.

3,899,960

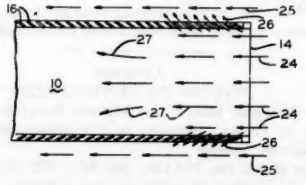
WIND-NEUTRALIZING PASSAGE

Paul W. Howells, Morrisville, N.Y., assignor to Syracuse University Research Corporation, Syracuse, N.Y.

Filed May 10, 1974, Ser. No. 468,754

Int. Cl. F24f *13/02*

U.S. Cl. 98—32 **6 Claims**



1. In a structure having oppositely facing entrances and exits each terminating in a passage having one end permanently open to the outdoors, whereby wind blowing toward one outdoor opening is unobstructed from blowing through the structure, at least one passage being a wind-neutralizing passage having at least one sidewall including a plurality of longitudinally successive vertically-extending louvers, each louver comprising an elongated narrow strip of sheet material, the successive strips being spaced longitudinally of the passage and each strip being of curved airfoil-shaped cross section, the leading edge of each louver strip facing the outdoors opening, each louver strip being curved from a portion extending substantially along the line of the inner side of the sidewall and curving away from the leading edge toward the outer side of the sidewall to a trailing edge facing away from the outdoor opening for aspiration of wind-blown air from the passage through the spaces between the louver strips.

3,899,961

PORTABLE COOKING APPLIANCE

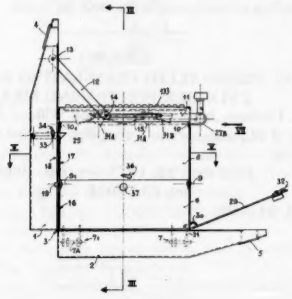
Pierre J. Tanguy, Pontoise, France, assignor to Etud S.A., Dijon, France

Filed July 3, 1973, Ser. No. 376,240

Claims priority, application France, July 6, 1972, 72.24595

Int. Cl.[2] A47J *33/00, 37/07;* **F24C** *5/20*

U.S. Cl. 99—340 **12 Claims**



1. In a portable and folding cooking appliance having a bottom and a cover which in folded position appear as a closed case, said appliance comprising an oven having a base and a rear wall respectively adjacent to the bottom and to the cover of said case, said oven moreover comprising collapsible side walls and a top portion associated with an external hotplate, and connecting means between said cover of the case and the top portion for an automatic unfolding operation of the structure of the oven when the case is opened; the improvement wherein said connecting means comprise at least one rod having a pivot linkage on one of its ends and a slidable pivot linkage on the other end, each side wall of the oven comprising two substantially flat portions which are pivotally linked to each other and pivotally linked to the base and to the top portion of the oven respectively, said three pivot linkages comprising parallel axes which are horizontal in the service position of the appliance, on each side of the unfolded oven.

3,899,962

PASTRY BAKING APPARATUS

Arthur Federico, 4 Explorer Rd., Brigantine, N.J. 08203

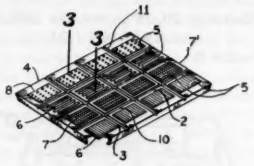
Filed Jan. 24, 1974, Ser. No. 436,106

Int. Cl. A47j *37/01*

U.S. Cl. 99—447 **1 Claim**

1. Pastry baking apparatus comprising a substantially rectangular frame element having a raised peripheral flange provided with longitudinally spaced openings, an inwardly directed ledge and integral reinforcing elements extending diagonally between opposite corners of the frame element, and a tray element substantially coextensive with the frame element adapted to be disposed within said peripheral flange providing a plurality of substantially identical rectangular cells separated by elongated ribs having substantially V-shaped longitudinal grooves in their upper surfaces aligned with said flange open-

ings when the tray element is disposed within said flange and reticulate pastry supporting means extending across said cells



(between) and connected with said ribs for supporting pastry in uniformly spaced relation to said frame element.

3,899,963

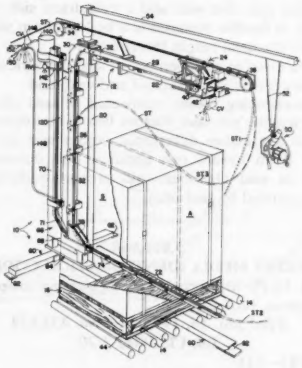
ARTICULATED STRAP CHUTE AND GUIDE MEANS THEREFOR

Donald R. Tremper, Mount Prospect, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Dec. 11, 1973, Ser. No. 423,700

Int. Cl.[2] B65B *13/04*

U.S. Cl. 100—25 **7 Claims**



1. In a strapping installation of the character described, in combination, means defining a strapping station, a flexible strap chute for guiding a length of strapping endwise and forwardly across the strapping station and beneath an article disposed at said station, a guide channel for said chute and within which the latter is slidable endwise between a retracted position wherein the chute is disposed substantially wholly within the confines of the channel and a projected position wherein at least a major portion of the chute is projected forwardly from the channel, said channel embodying a relatively short horizontal distal section the forward end of which is disposed below the level of the article and a relatively long proximate vertical storage section which extends upwardly alongside the article and in close proximity thereto, internal tracks coextensive with said guide channel, said chute being unidirectionally flexible so that it may follow the contour of the guide channel during retraction thereinto and projection therefrom and so that the projected portion thereof is self-supporting in cantilever, said strap chute being of an articulated nature and consisting of a series of relatively short chute bodies hingedly connected together in end-to-end fashion and having cooperating abutments on the opposed ends of each adjacnet pair of chute bodies, said abutments being effective when in engagement with each other to maintain such adjacent pair of chute bodies in linear alignment, said chute bodies being provided with antifriction guide members thereon which are slidable in said tracks, guide means disposed between said channel and article for directing said length of strapping endwise into the proximate end of a projected portion of the chute, and means for selectively projecting and retracting said chute.

3,899,964

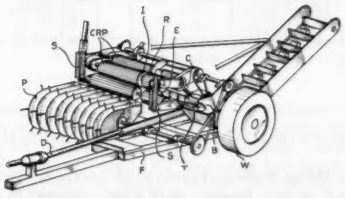
ROTARY HAY-BRIQUETING MACHINE FOR COMPACTING FIBROUS MATERIAL

Joseph Molitorisz, 624 81st Ave. N.E., Bellevue, Wash. 98004

Filed Jan. 29, 1973, Ser. No. 327,678

Int. Cl. B30b *3/04*

U.S. Cl. 100—89 **9 Claims**



1. A rolling-compacting machine for forming loose fibrous material, such as hay, into a dense cylindrical core which is cut into briquets, comprising: both a primary roller system and a secondary roller system of an overall core forming channel, said overall core forming channel confined by and having a plurality of at least four circumferentially spaced skewed power driven compression rollers, there being at least four sets of aligned rollers each set having a primary and one secondary compression roller of each system arranged in aligned pairs and mounted on a common shaft, said primary and secondary rollers of each set being distinctly separated by an interspace, a cutting mechanism located in said interspace to sever the oncoming continuous dense core of fibrous material after it is formed in the primary roller system, into desired length briquets, said briquets remaining close together and receiving additional rolling compressing by performing a plurality of revolutions in said secondary roller system of the core forming channel, before the briquets are discharged at the exit of the overall core forming channel, said primary roller system having an axial extending material inlet between two adjacent primary skewed power driven compression rollers, the primary and secondary roller systems being coaxial.

3,899,965

ROLL PRESS

Friedhelm Koch, Bergstrasse 1b, and Walter Siepermann, Konigsteiner Strasse 90, both of 432 Hattingen, Ruhr, Germany

Filed Feb. 6, 1974, Ser. No. 439,891

Claims priority, application Germany, Feb. 6, 1973, 2305626

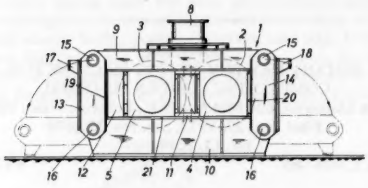
Int. Cl. B30b *3/00, 3/04*

U.S. Cl. 100—155 **3 Claims**

1. In a roll press in which roll bearings rest in bearing housings movably kept in parallel guides in the press frame, and wherein the bearing housings bridge the parallel guides and are fixed in these guides by means of lateral top pieces, at the ends of said guides, the improvement wherein:

at least one of said top pieces is pivotably connected about a lower horizontal axis to said press frame and wherein the inside surface of said pivotably mounted top piece is designed as a gliding surface and wherein said pivoting

axis is so trued that said gliding surface forms an extension of said parallel guide when said top piece is pivoted



into a horizontal position whereby the rollers may be easily removed by sliding therealong.

3,899,966

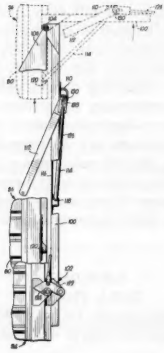
MACHINE FOR LOADING, STACKING AND UNLOADING CROPS

Allen A. White, Peabody; Harold Keith Garrison, Newton, and Dean P. Brooks, Hesston, all of Kans., assignors to Hesston Corporation, Inc., Hesston, Kans.

Division of Ser. No. 261,346, June 9, 1972, Pat. No. 3,842,730, which is a division of Ser. No. 139,391, May 3, 1971, Pat. No. 3,691,741. This application Oct. 11, 1973, Ser. No. 405,556

Int. Cl.[2] B30B *9/30*

U.S. Cl. 100—255 **8 Claims**



8. A stacker including:

a container adapted to receive a crop to be stacked and provided with a shiftable endgate element;

a vertically reciprocable press element carried by the container for forming the crop in the container into a compact stack; and

mechanism including a selectively shiftable member on one of said elements movable to and from a position operably intercoupling the elements for opening the endgate element as the press element is moved toward one end of its path of travel.

3,899,967

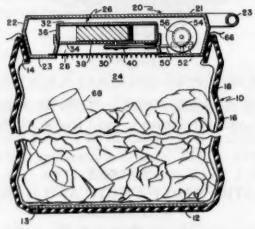
TRASH COMPACTOR

Richard T. Powers, 3623 Herschel Ave., Cincinnati, Ohio 45208

Filed Aug. 20, 1973, Ser. No. 389,576

Int. Cl.[2] B30B *1/23*

U.S. Cl. 100—269 R **5 Claims**



1. A trash compactor comprising:

means for forming a variable volume trash-receiving chamber, said chamber-forming means including first and second opposed end walls relatively displaceable toward one another to reduce the volume of said chamber, said chamber-forming means comprising:

an open-ended cylindrical chamber having a bottom wall defining said first wall and a cylindrical side wall comprised of flexible material in a bellows form yieldable to reduce the axial height thereof, and

a plug received in the open end of said cylindrical chamber thereby forming said second end wall; and

pressure-reducing means connected to said chamber for reducing the pressure therein below atmospheric to establish a pressure differential across said end walls to force them toward one another, thus compacting the trash in said chamber, said pressure-reducing means being carried by said plug.

3,899,968

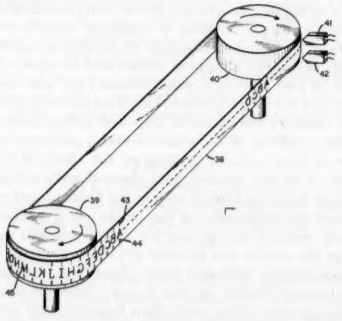
PRINT MEDIA IDENTIFICATION CODE

Bernard J. McDevitt, Norristown, Pa., assignor to Sperry Rand Corporation, Blue Bell, Pa.

Filed Jan. 16, 1974, Ser. No. 433,624

Int. Cl.[2] B41J *1/20*

U.S. Cl. 101—111 **4 Claims**



1. A high speed printer which utilizes an interchangeable print member and in which each said member carries a unique character set thereon; the improvement which comprises, a set of synchronizing marks disposed on each of said members, said set of synchronizing marks being coded to identify the character set carried by the associated member, each of said print members further containing a series of timing marks, a

shift register having a data input terminal and a shift input terminal, first reading means in the printer for reading the coded synchronizing marks contained on the print member utilized by the printer and for applying the marks so read to the data input terminal of said shift register, second reading means in the printer for reading the timing marks on the print member being utilized by the printer and for applying the timing marks so read to the shift terminal of said shift register to thus shift the signal read by said first reading means into said shift register, a first storage register, means transferring the contents of said shift register into said first storage register, a second storage register, means for storing in said second storage register a coded signal representing a preselected print member, and means for enabling a printing operation when the codes stored in said storage registers correspond and for inhibiting a printing operation when the codes stored in said storage registers do not correspond.

3,899,969

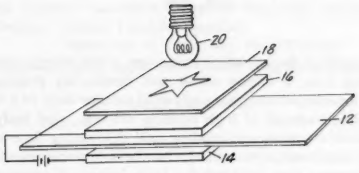
PRINTING USING PYROELECTRIC FILM

Allen L. Taylor, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 6, 1973, Ser. No. 385,847

Int. Cl. G03g *5/00, 13/08, 13/10*

U.S. Cl. 101—130 **11 Claims**



1. A method for printing an image pattern using a permanent master provided by a selectively, permanently poled pyroelectric material comprising the steps of:

1. heating a pyroelectric material to a poling temperature and exposing the heated material to an electric field, the combination of electric field and heat being applied to only selected portions of the pyroelectric material in accordance with an image pattern to be printed;
2. cooling said pyroelectric material to a temperature below said poling temperature while maintaining said electric field whereby the pyroelectric material is selectively, permanently poled in accordance with the image pattern to be printed;
3. heating the poled material uniformly to develop a charge pattern in accordance with the selective poling present in the material;
4. contacting the heated film with charged toner particles which are attracted to the pyroelectric material in accordance with the charge pattern;
5. placing a suitable copy substrate in registry on the material and toner to transfer said toner from said material to said copy substrate;
6. fusing said toner to said copy substrate; and repeating the steps after step 2 to form the desired number of copies.

3,899,970

APPARATUS FOR TRANSFERRING PAPER SHEETS BETWEEN SUCCESSIVE PRINTING UNITS

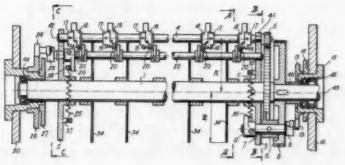
Josef Jurny, Sebranice, and Vaclav Sedlak, Jedovnice, both of Czechoslovakia, assignors to Adamovske Strajirny, narodni podnik, Adamov, Czechoslovakia

Continuation of Ser. No. 267,546, June 29, 1972, abandoned. This application June 10, 1974, Ser. No. 477,862

Claims priority, application Czechoslovakia, July 2, 1971, 4869-71

Int. Cl. B41f *21/04*

U.S. Cl. 101—230 **8 Claims**



1. Apparatus for use in a multicolor and perfecting printing press to transfer paper sheet from a first rotating drum to a second rotating drum, comprising a rotatable cylinder disposed between said drums for supporting said sheets during the transfer, projecting support means located on said cylinder and extending radially beyond the periphery of said cylinder, a carrier shaft journalled in the outer ends of said support means and rotatable about its own longitudinal axis and movable conjointly with said cylinder, a plurality of gripper means for gripping and transferring said sheet from said first to said second drum spaced along said carrier shaft, said gripper means comprising a first gripper member fixed on said carrier shaft and a second gripper member rotatable thereabout, a pinion secured at one end of the carrier shaft, said pinion engaging a swingable toothed segment, said segment being journalled on said cylinder for rotation about an axis eccentric of the cylinder axis, a lever arm fixed at one end to said segment and extending therefrom parallel to the cylinder axis, a first cam follower traversably mounted at the end of said lever and a first pair of cams each having a contour adapted to be selectively engaged by said first cam follower to reciprocate said segment thus causing said carrier shaft to rotate about its longitudinal axis and thus orienting said first and second gripper members to selectively engage the leading or trailing edge of said paper sheet on said first drum, and means for activating said second gripper member in either orientation to cause said gripper members to grasp said paper sheet and carry the same on rotation of said cylinder between said first drum and said second drum, said paper sheet being selectively transferred to said second drum without turning over for multicolor printing or with turning over for perfecting printing.

3,899,971

LABEL PRINTER

John S. Dudley, Douglas, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

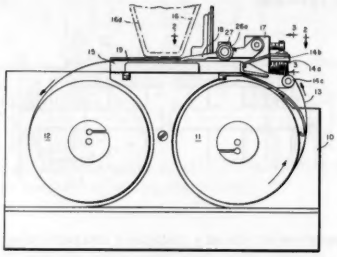
Continuation of Ser. No. 357,873, May 7, 1973, abandoned, which is a continuation of Ser. No. 187,732, Oct. 8, 1971, abandoned. This application Mar. 11, 1974, Ser. No. 449,926

Int. Cl. B41f *1/08*

U.S. Cl. 101—292 **2 Claims**

1. A label printing apparatus in which label stock in strip form are fed to the apparatus for applying print to the label stock, said label printing apparatus comprising a base, a platen supported by the base, a printing head movable back and forth between a printing position adjacent to the platen and a retracted position, means for intermittently feeding the stock over the platen, means for moving the print head to print on the stock and then retract the head, edge side wall guide means supported by the apparatus for guiding one edge of the

stock, and a roller unit supported by an arm supported by the apparatus including a roller means for engaging the stock and rotating with the movement of the stock, the axis of the roller being positioned at an angle with respect to a line at 90° to the side wall of the edge side wall guide means to urge the stock towards said edge side wall guides means, and said roller unit comprises an outer race, and an inner race supported by said arm, said roller being of a high coefficient of friction material and being supported by said outer race, a plurality of wedging rollers positioned between the inner and outer races and in



rolling contact with both of said races, a plurality of cut outs formed in the outer race which are of a dimension to permit the roller to freely rotate while positioned therein and a plurality of springs supported by the outer race, each spring urging a different one of said plurality of wedging rollers away from one of said cut outs, said rollers wedging themselves between the races when the outer race is rotated in one direction to prevent the stock from moving away from the edge guiding means and along the platen, spring means supported by the apparatus for urging said roller against said stock, and means for adjusting the pressure applied by said spring.

3,899,972

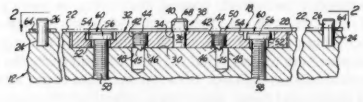
REGISTRATION-ADJUSTING PRINTING PLATE SADDLE

William H. Albright, 305 Ivanhoe Blvd., Orlando, Fla. 32804

Filed Aug. 27, 1973, Ser. No. 392,030

Int. Cl. B41f 27/12

U.S. Cl. 101—415.1 **9 Claims**



1. A registration-adjustment saddle for adjustably moving a flexible printing plate laterally relatively thereto, said saddle comprising

a saddle body of partially-cylindrical extent having essentially-cylindrical outer and inner surfaces and having circumferentially-spaced leading and trailing end faces,

means on one of said end faces for securing thereto one end of the printing plate,

an elongated movable plate-attachment support movably mounted on and extending along the central portion only of the other of said end faces for adjustment motion laterally along said central portion thereof,

means connected to said other end face for restricting said adjustment motion to lateral motion relatively to said central portion of said other end face,

and adjustably-movable plate-attachment means mounted on said movable support for adjustment motion unitarily therewith laterally along and relatively to said other end face,

said plate-attachment means on said plate-attachment support including a movable plate-attachment element mounted on said support for motion unitarily therewith,

said movable plate-attachment element being of such a size that it is snugly received by said plate,

said plate-attachment means also including fixed plate-attachment elements stationarily mounted on said other end face of said saddle body in laterally-spaced relationship to said movable element,

said fixed attachment elements being of such a size that they are loosely received by said plate.

3,899,973

IGNITION DEVICE FOR EXPLOSIVE CHARGES

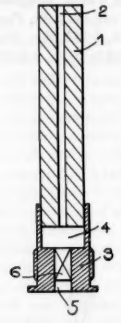
Alain Brocart, Bergerac, France, assignor to Societe Nationale des Poudres et Explosifs, Paris, France

Filed May 7, 1969, Ser. No. 822,413

Claims priority, application France, May 17, 1968, 68.152244

Int. Cl. F42b 7/00

U.S. Cl. 102—27 R **6 Claims**



1. An ignition device which comprises a low-energy energy detonating fuse, a casing about said detonating fuse, said casing consisting of a substantially rigid tubular body of a rigid combustible material of high burning velocity, said body of combustible material surrounding said detonating fuse such that said combustible material forms the sole encasement for said detonating fuse, said tubular body being self-supporting and being adapted to be disposed within a cartridge case or missile in direct contact with an explosive charge to be ignited, a base member fixedly engaged with said body, and priming means disposed within said base member in contact with said fuse.

3,899,974

ELECTRIC PROPULSIVE CHARGE IGNITER

Hans-Dieter Harnau, Wuppertal-Barmen, Germany, assignor to Rheinmetall GmbH, Dusseldorf, Germany

Filed July 31, 1973, Ser. No. 384,389

Claims priority, application Germany, Aug. 10, 1972, 2239325

Int. Cl. F42b 9/08

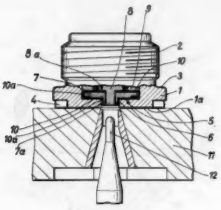
U.S. Cl. 102—46 **1 Claim**

1. An electric primer for a weapon having a breechblock with a passage for a firing pin and for mounting in a cartridge, the primer comprising:

a primer body formed at one end with an external thread receivable in said cartridge, an external shoulder at the other end forming a stop for said body, and a end face at said other end adapted to rest against said breechblock, said body being formed with an axially extending chamber and with an internal shoulder defining said chamber at said other end, said other end being provided with an axially extending bore terminating at said internal shoulder and said face communicating with said chamber;

a steel annular supporting disc received in said chamber and overlying said internal shoulder while being formed with a boss extending axially into said bore and terminating short of said end face;

a central contact axially engageable with said pin and having a projection substantially filling said boss, said contact being formed with a body portion resting against a surface of said disc turned away from said internal shoulder, said projection terminating flush with said boss;



an ignition piece surrounding said contact and bearing against said surface of said disc within said chamber;

a layer of insulation on said surface of said disc, around the periphery thereof, between said disc and said internal shoulder and surrounding said boss for insulating said ignition piece and said body from said disc; and

reinforcing means for said insulation at least along the periphery of said disc for providing a sealing action.

3,899,975

DISPENSING APPARATUS

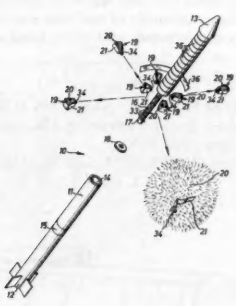
John Charles Lawrence, London, England, assignor to F. Bender Limited, London, England

Filed July 9, 1973, Ser. No. 377,214

Claims priority, application United Kingdom, July 11, 1972, 32388/72

Int. Cl. F42b *13/50*

U.S. Cl. 102—63 **21 Claims**



1. Appartus for forming, from a projectile in flight, a radar reflecting chaff cloud having a predetermined form, said appartus comprising:

a plurality of bundles of radar reflecting chaff;

ejection means, suitable for being carried by a projectile in flight, for ejecting said plurality of bundles of radar reflecting chaff from said projectile when said projectile is in flight; and,

bundle disintegration means forming a portion of each bundle for disintegrating each bundle subsequent to its being ejected from said projectile and scattering the chaff forming the bundle, each of said bundle disintegrating means including a timing mechanism for controlling the time interval between bundle ejection and bundle disintegration, said timing mechanisms controlling the bundle disintegration of their related bundles in a manner such that the time intervals between bundle ejection and bundle disintegration vary between selected ones of said bundles, said variations being controlled such that once all of the bundles have been disintegrated the scattered chaff forms a radar reflecting chaff cloud having a predetermined form, said form being determined by the controlled, variable time intervals occuring between bundle ejection and bundle disintegration.

3,899,976

CELL COOLING

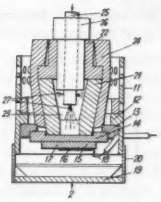
Richard John Arthur Harding, St. Albans, and Colin Roy Moss, North Mimms, both of England, assignors to Hawker Siddeley Dynamics Ltd., England

Filed Apr. 25, 1967, Ser. No. 635,953

Claims priority, application United Kingdom, Apr. 29, 1966, 19071/66

Int. Cl.² F42C *11/00*; **F25B** *19/00*

U.S. Cl. 102—70.2 R **10 Claims**



1. Apparatus for the rapid two-phase cooling of a small mass, such as a semi-conductor cell in a fuse, comprising a boil-off chamber so arranged in relation to the mass to be cooled that the mass will partake of a temperature reduction in said chamber, a normally sealed reservoir containing liquid refrigerant, a supply passage extending between said reservoir and said chamber, a separate source of gas under pressure, means operable to release liquid from said reservoir through said supply passage into said boil-off chamber at a selected time, and means conducting gas from said gas source into said boil-off chamber a predetermined time period after said release of liquid refrigerant to promote the evaporation of the refrigerant liquid and thereby reduce the temperature below the free boiling refrigerant temperature.

3,899,977

DEMOLITION CHARGES

Alois Schiessl, Bad Reichenhall, Germany, assignor to Firma Buck K. G., Bad Uberkinger, Germany

Filed Dec. 14, 1973, Ser. No. 424,742

Claims priority, application Germany, Dec. 14, 1972, 2261223

Int. Cl. F42b *11/24, 13/14*

U.S. Cl. 102—90 **6 Claims**

1. A demolition charge assembly for being mounted on equipment such as machines and telecommunication mechanism and destroying such equipment, said charge assembly comprising:

a plurality of interconnected charges, each charge comprising a cube-shaped housing containing an alumino-thermic mixture which, when activated, is operable to produce a molten reaction product for destroying said equipment, at least four of the sides of said housing each including:

one of a dovetail tongue portion and dovetail groove portion coupled to a mating one of a dovetail tongue portion and dovetail groove portion of an adjoining side of an adjacently disposed charge to establish a dovetail connection therebetween, and

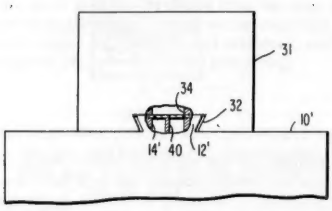
an ignition-transmission opening extending through the dovetail connection portion of each associated housing side such that the ignition-transmission openings of adjoining sides of adjacently connectedly charges are mutually aligned;

a dovetail connection portion of a selected charge of said charge assembly being arranged to receive a mating dovetail connection portion of a fuse such that an ignition-transmission opening of the fuse is mutually aligned with an ignition-transmission opening of said selected charge so that ignition of said fuse is transmitted to said selected charge and to adjacent charges through said mutually aligned ignition-transmission openings;

each charge being arranged to connectably receive a plurality of charges to form charge assemblies of diverse sizes and shapes to destroy equipment of diverse sizes and shapes.

6. A demolition charge assembly for being mounted on equipment such as machines and telecommunication mechanism and destroying such equipment, said charge assembly comprising:

a plurality of interconnected charges, each charge comprising a cube-shaped housing containing an alumino-thermic



mixture which, when activated, is operable to produce a molten reaction product for destroying said equipment, at least four of the sides of said housing each including:

a dovetail groove portion aligned with a mating one of a dovetail groove portion of an adjoining side of an adjacently disposed charge to define a recess therebetween, an ignition-transmitting dovetail double tongue disposed in said recess to define a dovetail connection between said charges to define a dovetail connection therebetween, and

an ignition-transmission opening extending through each dovetail groove of each associated housing side such that the ignition-transmission openings of adjoining sides of adjacently connectedly charges are mutually aligned;

a dovetail groove of a selected charge of said charge assembly being arranged to be aligned with a mating dovetail groove of a fuse and receive a dovetail double tongue within a recess defined thereby such that an ignition-transmission opening of the fuse is mutually aligned with an ignition-transmission opening of said selected charge so that ignition of said fuse is transmitted to said selected charge and to adjacent charges through said mutually aligned ignition-transmission openings;

each charge being arranged to be connected to a plurality of charges to form charge assemblies of diverse sizes and shapes to destroy equipment of diverse sizes and shapes.

3,899,978

FIN-STABILIZED SUBCALIBER PROJECTILE

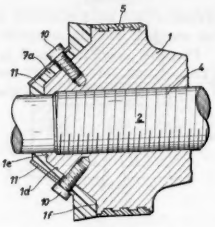
Hans Werner Luther, Holzuttgen; Rudolf Romer, Kaarst; Jurgen Winkelmann, Kaarst, and Winfried Rossmann, Kaarst, all of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Germany

Filed July 17, 1973, Ser. No. 379,970

Claims priority, application Germany, July 22, 1972, 2236142

Int. Cl. F42b *31/00, 13/16*

U.S. Cl. 102—93 **1 Claim**



1. In combination with a fin-stabilized subcaliber projectile having a projectile body with a central portion provided with a multiplicity of formations in the configuration of a screw thread and an end portion provided with stabilizing fins, the improvement which comprises:

a drive cage surrounding said central portion and formed with a plurality of segments configured with internal threads to engage said formations and adapted to spread apart from said body in flight;

a ring surrounding said segments at an end of said cage turned toward said fins for retaining said segments temporarily together and against said body, said cage being formed at said end turned toward said fins and adjacent said ring with a frustoconical portion tapered toward said fins,

a frustoconical sealing disk overlying said frustoconical portion and adapted to apply radially inward force to said segments to retain them against said body upon the application of gas pressure to said disk; and

means for securing said disk to said segments, and including screws threaded into said segments through said disk and having heads outwardly of said disk and respective washers interposed between said screw head and said disk.

3,899,979

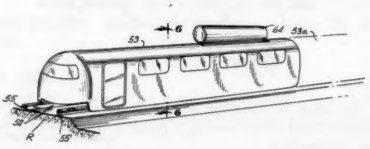
MAGNETIC SUSPENSION SYSTEMS FOR VEHICLES

Frank W. Godsey, Jr., St. Petersburg, Fla., assignor to Buryan Associates, Scarsdale, N.Y.

Filed Feb. 22, 1973, Ser. No. 334,887

Int. Cl. B61b *13/08*

U.S. Cl. 104—148 MS **7 Claims**

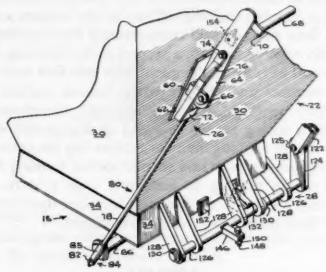


1. In a vehicle for magnetic suspension: a number of permanent magnets secured to the vehicle, with a number of electromagnets secured endwise to the permanent magnets; the combined magnets having poles spaced along a track and facing upwardly for attraction to the track, each said electromagnet having a core comprising a substantially vertical bar with one end surface facing the track and a surface of another end portion secured to the permanent magnet.

3,899,980
HOPPER CLOSURE ASSEMBLY

Albert J. Florig, Norristown, Pa., assignor to Florig Equipment Company, Inc., Conshohocken, Pa.

Filed July 29, 1974, Ser. No. 492,861
Int. Cl. B61d 7/02
U.S. Cl. 105—299 10 Claims

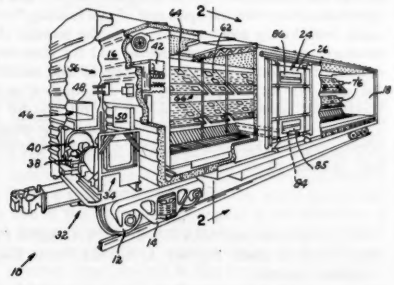


1. A hopper gate assembly for closing a discharge outlet in a hopper comprising a hinge supported on the hopper adjacent the discharge outlet, a discharge door pivoted on the hinge, a toggle closing means between the hopper and the discharge door for pivoting the discharge door from a wide open position to a near closed position over the discharge outlet, and a toggle locking and opening means fixedly supported with respect to the hopper and engageable with the discharge door for closing and locking the discharge door in the closed position when operated in a first direction and for applying force to open the discharge door when operated in a second direction.

3,899,981
BAFFLED BULK SHIPMENT OF PERISHABLE LADING IN INSULATING BOX CARS AND REFRIGERATOR CARS

Edgar F. Josephson, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Oct. 31, 1973, Ser. No. 411,364
Int. Cl.[2] B61D 3/00
U.S. Cl. 105—355 53 Claims



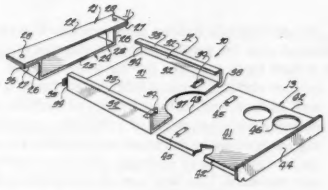
1. An insulated railway box car for transporting perishable lading comprising:

generally vertically extending spaced apart railway car sides having insulation provided thereon at least through a substantial portion of the vertical extent; generally spaced apart railway car ends joined to said car sides, said ends having insulation provided on at least a substantial portion of the vertical extent, an insulated roof joining said sides and ends; and at least one layer of baffles in said car making an angle of from about 30° to about 50° with respect to the horizontal and adapted to reduce the weight that the upper lading would normally exert upon the lower lading in the absence of the baffles; and wherein lading openings are provided in said baffles whereby the lading passes through said openings to assume positions below said baffles whereby full utilization of the car volume can be obtained.

3,899,982
PULL OUT TABLE FOR ATTACHMENT BENEATH AN AUTOMOBILE DASHBOARD

Richard J. Fetzek, 2615-B Magnolia Ln., Minneapolis, Minn. 55441

Filed Jan. 28, 1974, Ser. No. 437,751
Int. Cl.[2] A47B 37/00
U.S. Cl. 108—25 9 Claims



1. A pull out table adapted for attachment beneath the dashboard of an automobile and movable between a retracted position disposed beneath the dashboard and an extended position projecting outwardly of the dashboard into the passenger compartment for convenient use thereof by occupants of the automobile, the apparatus comprising:

a supporting bracket adapted to be attached to the undersurface of said dashboard in a manner extending transversely of said vehicle, said supporting bracket having a rectangularly shaped compartment defined therein and open at the front and back ends thereof;

a table holder including a substantially flat rectangularly shaped bottom surface, vertically extending side wall surfaces disposed along each side edge of said bottom surface, and an inwardly directed flange formed integrally with the top edge of each bottom surface side wall surface and extending outwardly therefrom in confronting relationship in a manner substantially parallel to the plane of said bottom surface, said table holder having a back edge and a front edge, said bottom surface and said side wall surfaces of said table holder being of a size and configuration adapted to be slidingly received in said supporting bracket compartment for reciprocal sliding movement relative thereto;

means operatively associated with said table holder to limit the forward movement of said table holder relative to said supporting bracket;

a table member comprised of a substantially flat rectangularly shaped platform having a pair of downwardly projecting side rails disposed along opposite side edges thereof, said platform having a back edge and a front edge, said table adapted to be slidingly inserted and received in said table holder with said platform overlying said table holder bottom surface and with said platform side rails in juxtaposition with adjacent table holder side wall surfaces with the bottom edges of said side rails in sliding engagement with the top surface of said table holder bottom surface whereby said table is reciprocally slidable in a telescopic manner from a position overlying said table holder bottom surface to a position projecting forwardly thereof; and

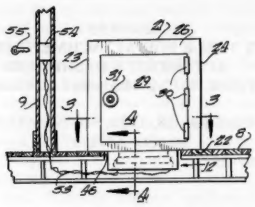
means on said table holder and cooperating means on said platform operative to limit the forwardmost projection of said table relative to said table holder.

3,899,983

SAFE HAVING A CONCEALED COMPARTMENT

Antonio Januario Hernandez, 315 "F" St., Harlingen, Tex. 78550

Filed May 3, 1974, Ser. No. 466,789
Int. Cl.[2] E05G 1/00
U.S. Cl. 109—54 1 Claim



1. A safe having a hidden compartment therein defining an additional area for safekeeping of valuables comprising:

A hollow body member having a top surface, a horizontal bottom surface, vertical side wall surfaces, a vertical back wall surface and vertical front wall surface, said surfaces defining interiorly thereof a chamber, said chamber having an opening in the front wall surface providing access thereto with a door pivotally affixed to said front surface and moveable into and out of said front surface opening to provide controlled access to said chamber;

a chamber having a top surface, bottom surface, opposed side wall surfaces and a back surface;

a hollow rectangular base section formed as an integral part of said safe body and projecting downwardly from said bottom surface thereof, said base having a cross-section area less than the cross-section area of said bottom surface and adapted to be received in an opening in a supporting floor surface on which said safe body is restingly supported on said bottom surface such that said base section is completely hidden and concealed within said supporting floor, said base section being hollow and defining an interior concealed compartment disposed therein immediately beneath said chamber floor surface;

a flat floor plate forming said chamber bottom surface, said floor plate being hinged to one of said wall surfaces of said chamber to provide selective access to said concealed compartment disposed there beneath, said floor plate defining the bottom surface of said chamber and having a pair of hinges with each hinge having one leg thereof affixed to a bottom surface of said floor plate adjacent the back edge thereof, the opposite leg of each hinge being secured to a back surface of said hidden compartment whereby each of said hinges are hidden from view in said chamber when said floor plate is in a position closing said compartment, said device including a stop member affixed to a front wall surface of said compartment and adapted to restingly receive the front edge portion of said floor plate thereon when said floor plate is in compartment closing position;

means for selectively retaining said floor plate in a normal position forming the bottom of said chamber and closing said compartment, said means comprising an electrically operated electromagnet mounted by a bracket interiorly of said compartment adjacent the front wall portion thereof, said electromagnet adapted to engage the bottom front edge portion of said floor plate within the closed position resting on said stop member, said means having suitable electrical leads extending from said electromagnet out of said base section and adapted to be routed to a position remote from said safe, the means further including a key operated electric switch connected to said wires and a suitable source of electrical energy connected to said wires whereby said electromagnet is normally energized to retain said floor plate in a closed position and whereby operation of said key switch will effect the electrical de-energization of said electromagnet permitting said opening means to effect a partial opening of said floor plate from said stop member to permit access to said hidden compartment; and

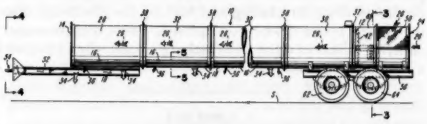
means disposed in said compartment and adapted to at least partially open said floor plate relative to said compartment upon release of said retaining means to provide access to said compartment, said means including a first socket forming member affixed to the bottom surface of said floor plate in said compartment and opening downwardly relative thereto, a second socket forming member disposed in vertical alignment with said first socket forming member and affixed to the bottom surface of said compartment and opening upwardly therefrom, and a resilient spring having one end in engagment with said first socket forming member and having the opposite end in engagement with said second socket forming member, said spring tending to resiliently urge said floor plate upwardly away from said stop member upon release of said floor plate from the electromagnet.

3,899,984

DEVICE GENERATING AND DIRECTING A FLOW OF COMBUSTION SUPPORTING GASEOUS MEDIA

Richard E. Keyes, Cincinnati, and Neil Justice, Milford, both of Ohio, assignors to The Finn Equipment Company, Cincinnati, Ohio

Filed May 20, 1974, Ser. No. 471,356
Int. Cl.[2] F23G 7/00
U.S. Cl. 110—18 R 15 Claims



1. A device for generating and directing the discharge of two individual streams of combustion-supporting gaseous media into an open top combustion pit, comprising: an elongate, substantially cylindrical housing having an open end and a closed end; a pair of circumferentially spaced, elongate discharge nozzles projecting radially therefrom and directed toward the combustion pit at one side thereof; and means in communication with the open end of said housing for continuously introducing gaseous media into the interior thereof at pressure greater than atmospheric and for directing a first stream of gaseous media through one of said nozzles across the open top of the pit from one side thereof and thence downwardly along the other side of the pit, and for directing a second stream of gaseous media through the other of said nozzles adjacent said one side of the pit and downwardly along said one side of the pit.

3,899,985

METHOD AND APPARATUS FOR PLANTING PLANTS

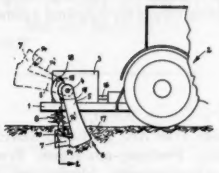
Karl Friedrich Rath, Farrach 1, A-9422 Maria Rojach, Catinthia, Austria

Filed Oct. 18, 1973, Ser. No. 407,584
Claims priority, application Austria, Nov. 6, 1972, 9423/73
Int. Cl.[2] A01C 11/00
U.S. Cl. 111—3 9 Claims

1. An apparatus for planting a plant having roots, comprising

1. a soil-penetrating tool,
2. a releasable clamping means for carrying the plant roots, the clamping means being mounted on the tool,
3. means operatively connected to the tool for introducing the tool carrying the plant roots into the soil, for moving the tool with the plant roots below the surface of the soil

into a position wherein the plant roots are separated from the tool, and for moving the tool out of the soil, and

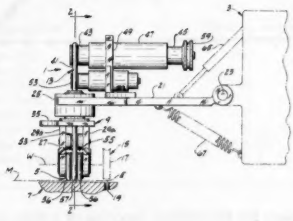


4. means operatively connected to the clamping means for releasing the clamping means in said position for separating the plants roots from the tool.

3,899,986
APPARATUS FOR GUIDING LIMP MATERIAL

William R. Conner, Jr., Shelbyville, Tenn., assignor to Stahl-Urban Company, Brookhaven, Miss.

Filed Mar. 27, 1974, Ser. No. 455,259
Int. Cl. D05b 27/12
U.S. Cl. 112—214 9 Claims

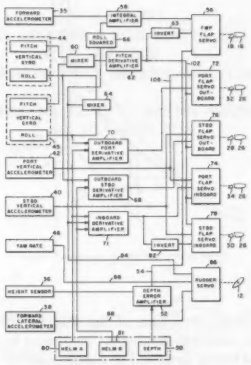


1. Apparatus for guiding material, such as a piece of textile material, in an automatic guidance system, said apparatus comprising a guide wheel and a back-up between which the material is fed, means mounting the wheel for rotation on a generally horizontal axis and for swinging movement about a generally vertical swing axis offset from the wheel axis on the upstream side of the wheel axis in respect to the direction of feed, and means for swinging said wheel mounting means about said swing axis to effect lateral swinging of the wheel to shift the material, characterized in that means is provided for positively driving the wheel in the direction of feed of the material, wherein said drive means comprises a belt and pulley drive wherein the belt is trained around a pulley on the wheel axis, wherein said drive means further comprises a drive pulley located remote from said guide wheel, said belt being trained around said wheel pulley and said drive pulley, and wherein said apparatus further comprises a frame adapted to be secured to a sewing machine or the like and bearing means carried by the frame mounting said wheel for lateral swinging of the wheel, said wheel mounting means including a hollow shaft journalled in said bearing means, said shaft having said vertical swing axis on its axis, said belt intermediate said wheel pulley and said drive pulley passing through said shaft.

3,899,987
FAIL-SAFE CONTROL SYSTEM FOR HYDROFOIL CRAFT

Willard E. Wright, Bellevue, and Andrew D. Tweeddale, Issaquah, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 10, 1974, Ser. No. 459,466
Int. Cl.[2] B63B 1/18
U.S. Cl. 114—66.5 H 6 Claims



1. In a control system for a hydrofoil craft having inboard and outboard port control surfaces and inboard and outboard starboard control surfaces for controlling the craft about its roll axis, the combination of:

means for sensing motion of the craft about its roll axis and for producing at least one electrical signal proportional thereto,

at least three signal channels responsive to an electrical signal proportional to roll motion for controlling said port and starboard control surfaces,

the output of one of said channels controlling only the outboard starboard control surface,

the output of a second of said channels controlling only the outboard port control surface, and

the output of the third of said channels controlling both of said inboard control surfaces only without controlling said outboard control surfaces.

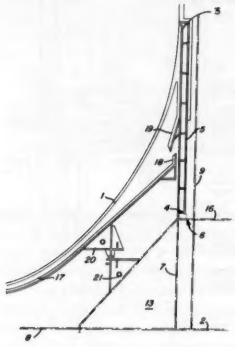
3,899,988
SHIPS EQUIPPED WITH PRESSURIZED CARGO TANKS SUPPORTED ON CONTINUOUS SHELLS

Jaime Torroja Menendez, Las Arenas, Spain, assignor to Sener, Tecnica Industrial y Naval, S.A., Las Arenas, Spain

Filed Sept. 4, 1973, Ser. No. 393,896
Claims priority, application Spain, Sept. 2, 1972, 406340
Int. Cl. B63b 25/16
U.S. Cl. 114—74 A 21 Claims

1. In ships having an independent pressurized cargo tank supported in a tank support comprising continuous shells, the improvement comprising a continuous skirt positioned on top of the double bottom floors of the ship and under said support shells, said skirt being stiffened and joined by its lower edge to said top of said double bottom and its upper edge being of the same perimeter as the lower edge of the lowermost internal shell in the tank support and disposed opposite it, a stiffened platform attached to said skirt and running between said upper edge and the inner shell of the hull, a number of flat plates positioned between the platform and said skirt perpendicular to the base plane of said ship, said plates being stiffened and facing the floors and longitudinal girders and being

welded by their internal and upper edges to said skirt and said platform, respectively, and by their bottom edge to the top of said double bottom, the external edges of said plates being welded to the inner shell of the ship, with the plates facing the floors, and to the skirt of an adjacent tank or to the end transverse bulkhead of the cargo tank zone, with the plates facing the longitudinal girders, a tray positioned under the tank



independent of the structure of the ship and of the structure of the support, said tray having an insulating layer and a stiffening ring and being designed to catch possible small leaks of transported liquid, and a continuous leak deflection plate joined by its external edge to the inner shell of the tank support, the free edge of said tray being positioned next to the inner shell of the tank support below said deflection plate.

3,899,989

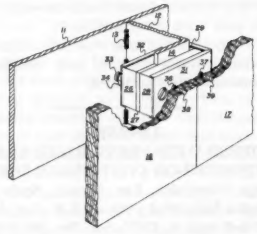
MARINE PANEL HANGING ASSEMBLY

Gerald L. Glazebrook, El Cajon, Calif., assignor to National Building Industries, National City, Calif.

Filed Oct. 10, 1973, Ser. No. 405,017

Int. Cl.[2] B63B *3/68*

U.S. Cl. 114—84 **3 Claims**



1. A panel hanging assembly for coupling insulative panels to a vertically disposed metallic member comprising:

an insulative block having one surface abutting a vertical metallic member, said vertical metallic member being fixedly attached to a structure and has one section thereof substantially at right angles to said structure and another section thereof substantially parallel to said structure, said insulative block having one surface abutting an outside surface of said another section of said metallic member;

a metallic bracket;

first coupling means coupling said metallic bracket to said insulative block to a surface opposite said abutting surface;

a second insulative block abutting a back surface of said another section;

said first coupling means comprises a clamp screw and nut, said clamp screw passing through said metallic bracket, said insulative block, and said second insulative block, spatially disposed from said metallic member and in threadable engagement with said clamp nut; and

second coupling means for coupling a panel to said metallic bracket.

3,899,990

SYSTEMS FOR ANCHORING SHIPS AT SEA

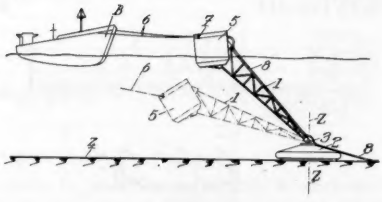
Claude Lecomte, Fontenay-aux-Roses, France, assignor to Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H., France

Continuation of Ser. No. 146,127, May 24, 1971, abandoned. This application July 16, 1973, Ser. No. 379,817

Claims priority, application France, June 10, 1970, 70.21365

Int. Cl. B63b *21/04*

U.S. Cl. 114—230 **3 Claims**



1. A device for the surface mooring of a ship on a body of water comprising:

a. a base anchored to the bottom of the body of water;

b. an arm having a free end with the other end pivotally connected to the base;

c. a hollow interior buoy secured to the free end of the arm so that when the buoy is floating at the surface of the water substantially all of the arm is normally below the surface and extends diagonally to the base, said buoy and arm having means for mooring a ship thereto;

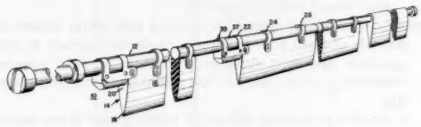
d. means on the buoy and arm for ballasting and deballasting the buoy so as to arcuately move the free end of the arm from an upper position near the surface of the water to a lower position near the bottom;

e. said means for the ballasting and deballasting comprising: a pipe for fluid coming from a distant control station and capable of being pressurized or discharged, said pipe extending along the arm and connected to the buoy to be in communication with its interior, a hole formed in the bottom of the buoy to establish communication between the interior of the buoy and the body of water, at least one normally open valve at the upper part of the buoy positioned to form a communication between the buoy interior and the ambience, this valve being connected to the pipe to be actuated by said pressure so as to be closed when the pipe is pressurized and to open when the pipe is not pressurized.

3,899,991
WEATHER RESISTANT SEGMENTED FAIRING FOR A TOW CABLE

Clarence K. Chatten, Mesa, Ariz.; Saul A. Eller, Whitestone, N.Y.; Reece Folb, Laytonville, and Arthur P. Brisbane, Gaithersburg, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 17, 1973, Ser. No. 425,434
Int. Cl.[2] B63B *21/10*
U.S. Cl. 114—235 F **2 Claims**



1. A towing system for a variable depth sonar comprising: a substantially long tow cable:

means for securing a plurality of spaced fairing sections to said tow cable, said plurality of fairing sections having an axis of symmetry substantially normal to the longitudinal axis of said tow cable and having longitudinal axis substantially parallel to the longitudinal axis of said tow cable, each of said plurality of fairing sections having a leading edge and a trailing edge;

a plurality of support rings vulcanized to said tow cable along the longitudinal axis thereof;

a plurality of clips connected to said tow cable and to said plurality of fairing sections; and

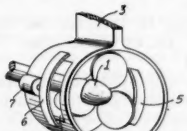
the trailing edge of each of said plurality of fairing sections being made from a first butyl rubber compound essentially of the following ingredients:

Ingredients	Parts by weight
Butyl-035	100
Elastopar	1
Philblack-E (SAF)	15
Zinc Oxide	3
Stearic Acid	2
Dioctyl Sebacate	10
Sulfur	1.25
Methyl Tuads	1.5
Captax	1.

3,899,992
MARINE STEERING DEVICE

Ronald George Fuller, P.O. Box 337, Hudson Heights, Quebec, Canada

Filed July 20, 1972, Ser. No. 273,494
Int. Cl. B63h *5/14*
U.S. Cl. 115—42 **9 Claims**

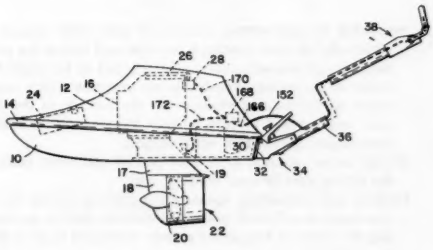


1. A marine steering device comprising a submerged duct, a propeller rotationally mounted on the axis within the duct and adapted to propel fluid through the duct, passages through both sides of the duct wall normal to the duct axis, means for selectively opening and closing, or partially opening and closing said passages through one side of the duct wall relative to the passages through the other side of the duct wall for the purpose of generating a pressure imbalance normal to the duct axis to thereby develop a steering force. Penetrating the walls of duct, one passage of each pair located in one side of the duct coequal about an axis intersecting the centerline of the duct, the other passage located in the other side of duct coequal about said axis intersecting the centerline of the duct, means for selectively opening and closing or partially opening and closing one passage of each pair of passages relative to the other passage of said pair to thereby produce a steering thrust.

3,899,993
TOW BAR ASSEMBLY FOR WATER-SKI TOWING DEVICE

Richard T. Powers, 3623 Herschel Ave., Cincinnati, Ohio 45208

Filed Oct. 12, 1973, Ser. No. 405,896
Int. Cl.[2] B63B *21/56*
U.S. Cl. 115—6.1 **15 Claims**



1. A water-ski towing device comprising:

a buoyant hull having a motor and a propeller assembly driven by said motor to provide a propulsive thrust;

a tow bar extending aft for towing a water skier; and

connecting means for connecting said tow bar to said hull, said connecting means providing a rigid connection in a first position between said tow bar and said hull during normal operation of said device, and being pivotal upwardly in a vertical plane from a second position to said first position during initial operation of said device, said connecting means comprising:

mounting means secured to said hull

the lower end of said tow bar being pivotally mounted on said mounting means for movement in said vertical plane; and

latching means for releasably latching said tow bar in said first position.

3,899,994
APPARATUS FOR APPLICATION OF LACQUER COATING TO CATHODE RAY TUBE PANELS

Charles A. Cook, Buffalo Grove, and Thaddeus J. Hajduk, Chicago, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Division of Ser. No. 319,970, Dec. 29, 1972, Pat. No. 3,832,211. This application Feb. 4, 1974, Ser. No. 438,964
Int. Cl.[2] B05C *7/02*
U.S. Cl. 118—6 **14 Claims**

1. Rotary apparatus for automatically applying a lacquer coating over a phosphor coating on partially processed front panels of cathode ray tubes in a continuous step-by-step fashion while said panels are continuously maintained in a front-side-up attitude so that the phosphor coated surfaces of said panels are continuously directed downwardly, comprising:

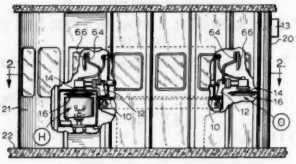
an annular endless conveyor defining a predetermined processing path;

a plurality of workpiece holding means serially attached to said conveyor for each receiving and supporting a panel front side up such that the phosphor coated surface of said panel is directed downwardly during its processing;

a plurality of discrete work stations disposed around the perimeter of said conveyor for receiving said workpiece holding means and panels;

indexing means for effecting step-by-step movement of said conveyor between said work stations;

spray applicator means situated on at least one of said work stations for spraying a lacquer coating onto the downwardly directed phosphor coating of a received panel;



moveable shroud means situated at the work station at which the lacquer coating is applied and means for positioning said shroud means over a panel to be coated in order to minimize undesirable air currents which might cause unwanted distrubances on the surface of the lacquer coating and to help contain lacquer vapors within the lacquer application work station;

drying means situated at at least one of said work stations for drying said lacquer coating; and

loading and unloading means for receiving panels to be conveyed to a first of said work stations and for presenting for removal lacquered panels conveyed from a final work station.

3,899,995

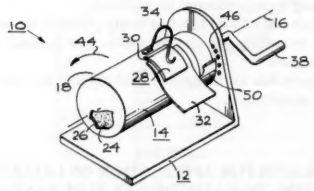
FINGERPRINTING ARRANGEMENT

Edward H. Robinson, 16704 Elgar Ave., Torrance, Calif. 95004

Filed Oct. 29, 1973, Ser. No. 410,798

Int. Cl. A61b *5/10*

U.S. Cl. 118—31.5 **6 Claims**



1. An improved fingerprint developing arrangement for providing a visually detectable fingerprint image on a preselected surface having a fingerprint thereon, comprising, in combination:

a frame means;

a drum means movably mounted on said frame means and having peripheral walls defining a powder containing cavity, and said peripheral walls having a first portion defining an aperture therethrough providing communication with said powder containing cavity;

fingerprint powder in said powder containing cavity;

closure means coupled to said peripheral walls of said drum means adjacent said aperture and movable thereon from an open position allowing access to said aperture to a closed position removably clamping the pre-selected surface having the fingerprint thereon over said aperture in powder sealing relationship to said first portion of said peripheral walls;

latch means coupled to said drum means for detachably clamping said closure means in said closed position to prevent said fingerprint powder from leaving said powder containing cavity for the condition of said closure means in said closed position thereof, said latch means comprising:

a spring loaded hinge means for coupling said closure means to said drum means, and said spring loaded hinge means resiliently biasing said closure means into said closed position thereof;

motion producing means for moving said drum means to provide contact between the pre-selected surface in said aperture and said fingerprint powder in said powder containing cavity, said motion producing means comprising:

a rotation producing means for rotating said drum means in a preselected arc of rotation about a pre-determined axis, and said fingerprint powder contacting the preselected surface in said aperture at least once during each movement in said preselected arc of rotation thereof; said drum means rotatably mounted on said frame means;

interlock means operatively connected between said frame means and said drum means for preventing said closure means from moving from said closed position to said open position thereof for a predetermined portion of said preselected arc of rotation of said drum means;

vibration producing means for inducing a vibration of said drum means to jar said fingerprint powder loose from regions adjacent said first portion of said peripheral walls, said vibration inducing means comprising:

a pluraility of protuberances coupled to said frame means in a preselected spaced relationship thereon adjacent said drum means:

a striker bar means mounted on said drum means in protuberance engaging relationship to said plurality of protuberances for sticking said protuberances and vibrating said drum means during predesigned portions of said pre-selected arc of rotation of said drum means.

3,899,996

APPARATUS FOR MAKING LIGHT ATTENUATING FILTERS

Yong S. Park, Roselle, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

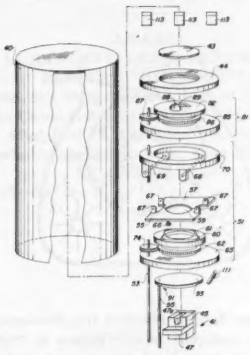
Filed June 10, 1974, Ser. No. 478,007

Int. Cl.[2] **C23C** *13/08*

U.S. Cl. 118—49.1 **6 Claims**

1. In a light attenuating filter coating apparatus of the type wherein a patterned coating of light attenuating material is deposited on a transparent substrate from a vapor beam emitted by a source of appropriately vaporized, light attenuating material, the improvement comprising means defining a noncircular aperture of time-varying size between said vapor source and said transparent substrate for controlling the impingement of the beam on the substrate, means for varying the size of said aperture as a predetermined function of time, so that the resulting light attenuating filter is characterized by iso-attenuation contours of which at least portions thereof are non-circular, said means for defining said aperture of time-

varying size comprising a pair of templates which are movable rectilinearly toward and away from each other along a path



substantially parallel to said transparent substrate and the confronting edges of the templates are essentially concave.

3,899,997

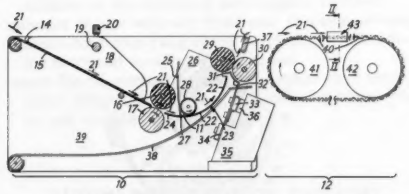
THERMOGRAPHIC APPARATUS

Ronald Frederick Ayers, 15-19 Church St., Twickenham, Middlesex, England

Continuation of Ser. No. 288,939, Sept. 14, 1972, abandoned. This application Sept. 13, 1974, Ser. No. 506,188

Int. Cl.[2] B05C *3/02*; **G03G** *13/08*

U.S. Cl. 118—68 **9 Claims**



1. Thermographic apparatus for the application of thermographic powder to a workpiece bearing freshly-printed matter, comprising: a trough of generally ν -shaped transverse cross-section for said thermographic powder, the transverse powder retaining walls of said trough being defined by an upwardly concave, workpiece support surface and a plate extending upwardly from a lower region of said upwardly concave surface, and the upper transverse extremities of the trough's transverse powder-retaining walls being defined by the upper transverse edges of said plate and surface; feeding means to feed a workpiece bearing freshly-printed matter into the trough between the lower transverse edge of said plate and said lower surface region and along at least part of said workpiece support surface; withdrawal means to withdraw the workpiece with thermographic powder adhering to said freshly-printed matter from the trough along at least part of said workpiece support surface and past the latter's upper transverse edge defining one of said upper transverse extremities of the trough; a floating roller disposed within said trough in the region of said workpiece infeed and beneath which the workpiece passes; and vibrator means to vibrate the workpiece free of surplus powder as it leaves the trough.

3,899,998

ROTARY COATING APPLYING NOZZLES

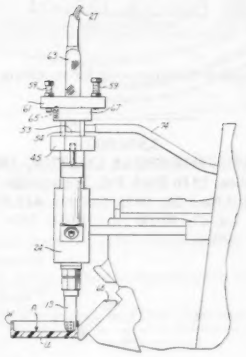
John Davies, Leicester, and Dennis E. Skinner, Syston, both of England, assignors to USM Corporation, Boston, Mass.

Filed Oct. 3, 1974, Ser. No. 511,504

Claims priority, application United Kingdom, Oct. 23, 1973, 49317/73

Int. Cl.[2] B05B *3/02*

U.S. Cl. 118—323 **12 Claims**



1. Apparatus for applying a coating to surface portions of a workpiece comprising:

a rotatable nozzle having an outlet port opening into a longitudinal bore in the nozzle;

a tube slidably mounted in said bore;

means for effecting relative movement between said nozzle and said tube lengthwise of said bore from a condition wherein said outlet port is uncovered such that coating material passes therethrough to a condition wherein said outlet port is closed by said tube to block it against the passage of coating material;

means for feeding coating material to said nozzle; and

means for rotating said nozzle about a longitudinal axis thereof during operation of said coating apparatus.

3,899,999

BLADE FOR APPLYING A FLOWABLE SUBSTANCE TO A MOVING ARTICLE

Alfred Christ; Sergio Tognola, both of Zurich, and Rolf Lehmann, Mutschellen, all of Switzerland, assignors to Escher Wyss GmbH, Zurich, Switzerland

Filed June 12, 1973, Ser. No. 369,194

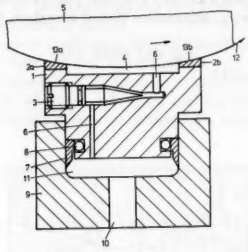
Claims priority, application Germany, June 13, 1972, 2228685

Int. Cl. B05c *5/02*

U.S. Cl. 118—405 **26 Claims**

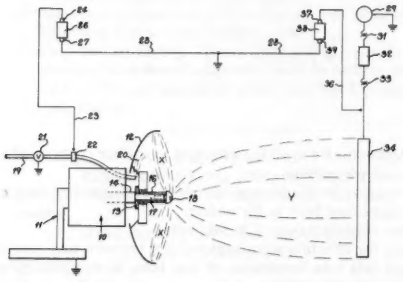
1. In combination, a blade for applying a flowable substance onto a moving article having at least one chamber for containing the flowable substance disposed transversely of the direction of the moving article and facing the moving article, and means for pressing said blade towards the moving article under a force opposed to the pressure of the flowable substance in said chamber to cause said blade to float on a cushion of the flowable substance on the moving article, said means including a fixedly mounted support member slidably

receiving said blade therein for movement perpendicularly of the moving article, said member and blade defining at least



one thrust chamber therebetween for receiving a pressurized medium.

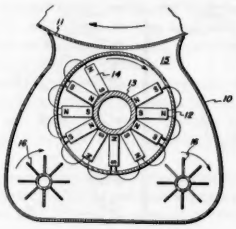
3,900,000
APPARATUS FOR SPRAY COATING ARTICLES
Thomas J. Gallen, 1516 Buck Rd., Feasterville, Pa. 19047
Filed Nov. 28, 1973, Ser. No. 419,569
Int. Cl.[2] B05B *5/02*; **B05C** *5/04*
U.S. Cl. 118—630 **10 Claims**



1. A sub-ionization spray coating system comprising, in combination, a grounded spray gun, a disc rotated by said spray gun for atomizing coating material, means for insulating said disc from said spray gun, a non-conductive hose for supplying said coating material to said disc, means for applying inductively a voltage of one polarity to said coating material while in said hose, whereby said coating material voltage is imparted to said disc to create an electrostatic field between said disc and said spray gun upon discharge of said coating material from said spray gun, a work piece to be coated with said coating material, and means for applying inductively a voltage of opposite polarity to said work piece, whereby an electrostatic field is created between said work piece and said spray gun.

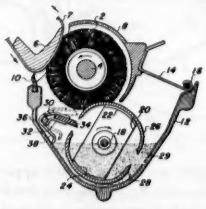
3,900,001
DEVELOPING APPARATUS
Lawrence J. Fraser, and Delmer G. Parker, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Division of Ser. No. 146,704, May 25, 1971, abandoned. This application Mar. 27, 1973, Ser. No. 345,424
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **11 Claims**

1. Electrostatographic developing apparatus for applying developer material to a developer receiving surface in conformity with an electrostatic charge pattern, said apparatus comprising stationary multipole magnet means to form dry magnetically attractable developer material in a magnetic brush configuration in a region extending fr m a developer supply to a development zone formed adjacent the developer receiving surface; means to transport the dry magnetically attractable developer material in the magnetic brush configuration from the developer supply to the development zone, said



development zone formed between the developer receiving surface and the transport means; means to transport said developer through said development zone in magnetically unconstrained blanket contact with said charge pattern; and means to discharge unused developer from said development zone.

3,900,002
DONOR APPARATUS
Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Division of Ser. No. 251,954, May 10, 1972, Pat. No. 3,848,566, which is a division of Ser. No. 864,265, Sept. 24, 1969, Pat. No. 3,687,106, which is a continuation-in-part of Ser. No. 840,967, July 11, 1969, abandoned. This application Aug. 30, 1973, Ser. No. 393,248
Int. Cl. G03g *13/06*
U.S. Cl. 118—637 **3 Claims**



1. In a development system for developing latent patterns employing electrostatic marking particles:

a plurality of elongated donor members each having a surface portion capable of holding marking particles thereon;

support means for maintaining adjacent ones of said donor members substantially in parallel and spaced apart, said support means including flexible linking means for coupling adjacent ones of said elongated donor members to each other;

means coupled to said support means for moving said donor members through a path which defines a volume having one dimension substantially equal to the elongation of said donor members, said means coupled to said support means including at least two drive gears spaced apart in the direction of elongation of said donor members each having gear teeth spaced to accommodate the spacing between said adjacent donor members, said linking

means and said coupled donor members being entrained about said drive gears; and

a housing containing a quantity of marking particles and supported relative to said support means to position a portion of said quantity of marking particles within said volume.

3,900,003

LIQUID DEVELOPING DEVICE FOR ELECTROPHOTOGRAPHY

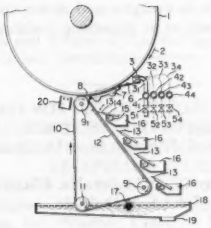
Tadashi Sato, and Shunichi Kubo, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 13, 1974, Ser. No. 478,976

Claims priority, application Japan, June 15, 1973, 48-67438

Int. Cl. G03g *13/06*

U.S. Cl. 118—637 **19 Claims**



1. A liquid developing device for electrophotography comprising:

a selective developing solution supply means whereby a developing solution of any designated color is selected from developing solutions of different colors and supplied to an electrophotographic sensitive member in successive relation with the developing solutions of other colors;

a common developing means disposed in a developing position to retain sequentially each said supplied developing solution on the surface of said sensitive member;

movable means separate from said common developing means for transporting excess developing solution flowing out from said developing means; and

means for recovering the developing solutions of respective colors separately from each other during transportation by said movable transporting means.

3,900,004

AUTOMATIC CIRCULATING HATCHERY

Marvin A. Goldman, Great Neck, and Jerome N. Goldman, New York, both of N.Y., assignors to Penn-Plax Plastics, Inc., Garden City, N.Y.

Filed Apr. 1, 1974, Ser. No. 457,541

Int. Cl.² A01K *63/00*

U.S. Cl. 119—3 **6 Claims**

1. In a hatchery assembly for an aquarium and having a hatchery tank for separating and accommodating adult pregnant fish, and a source of compressed air, the combination which comprises

a. a separable nursery tank for disposal on said hatchery tank;

b. means dividing said hatchery tank into a separate adult pregnant fish retention area, said dividing means allowing passage of hatched baby fish therethrough;

c. flow communication means between said source and said hatchery and nursery tanks;

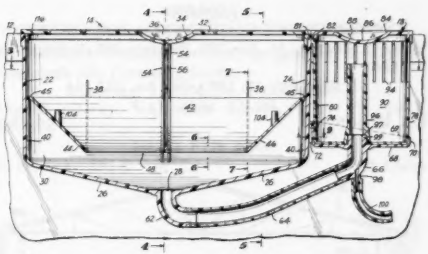
d. openings in said hatchery tank allowing water flow from an aquarium into said tank;

e. means in said flow communication means causing continuous flow of water through said hatchery tank to said nursery tank;

f. openings in said nursery tank spaced from the bottom thereof, allowing continuous circulation and water overflow therethrough, said openings being dimensioned to prevent the passage of baby fish therethrough;

g. an opening in the bottom of said hatchery tank below said dividing means;

h. a first nipple integral with said hatchery tank defining said opening;



i. a second nipple disposed adjacent said nursery tank defining an opening thereto;

j. said second nipple having an opening connected to said source;

k. an annular stack centrally of said nursery tank and integral therewith;

l. said stack being in flow communication with said second nipple; and

m. a flexible line joining said first and second nipple.

3,900,005

MILKING MACHINE

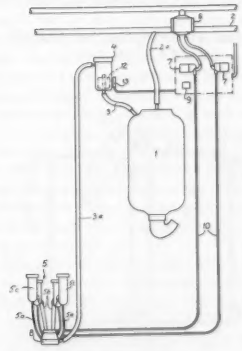
Frank Edward Goldsmith, Cwmbran, England, assignor to Alfa-Laval AB, Tumba, Sweden

Filed May 21, 1974, Ser. No. 471,853

Claims priority, application United Kingdom, May 21, 1973, 24118/73

Int. Cl. A01j *5/04*

U.S. Cl. 119—14.41 **3 Claims**



1. A milking machine including teat cups each having a shell and a liner, the pulse space between the shell and the liner being subjected alternately to atmospheric pressure and a vacuum to expand and contract the liner while the space within the liner is subjected to a milking vacuum, a milk flow indicator associated with the teat cups for detecting changes in the flow rate of milk from the teat cups, and means operable in response to changes in the flow rate of milk as detected by said indicator for regulating the flow of air from the pulse space to effect gradual opening of the liner when the milk flow

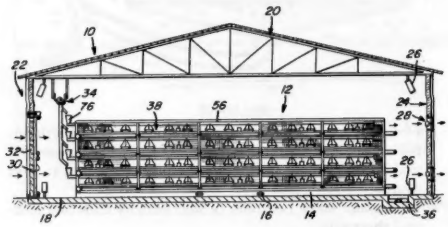
rate is below a predetermined level, said regulating means comprising a solenoid valve having a valve seat, a valve member, resilient means biasing the valve member toward the valve seat to close the valve, and a solenoid operable to open the valve against the action of said resilient means when the milk flow rate exceeds said predetermined level, the force of said resilient means being sufficient to move said valve member to its closed position when said solenoid is deenergized.

3,900,006

CONTAINERIZED CAGE SYSTEM FOR CHICKENS

Walter I. Shockley, Jr., Box 180, Dagsboro Rd., Salisbury, Md. 21801

Filed July 27, 1973, Ser. No. 383,311
Int. Cl. A01k *31/18*
U.S. Cl. 119—18 **11 Claims**



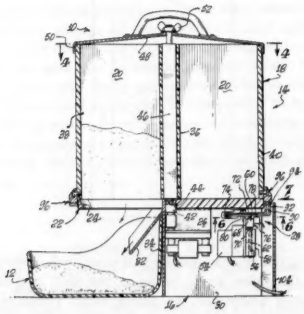
1. A poultry cage adapted to be transported from an environmentally controlled enclosure, comprising a box-like frame, foraminous walls supported by the frame, a flexible, trampoline-like floor made of a resilient sheet of material having perforations formed therein, means securing the floor only peripherally to the frame for elastic deformation under load, and conveyor belt means supported by the frame in spaced underlying relation to the floor for receiving and conveying droppings.

3,900,007

AUTOMATIC ANIMAL FOOD DISPENSER

Fenter Willie Smith, 1133 Coronado Ave., West Covina, Calif. 91790

Filed Jan. 11, 1974, Ser. No. 432,753
Int. Cl.[2] A01K *5/02*
U.S. Cl. 119—51.13 **7 Claims**



1. The automatic animal food dispenser comprising:

a frame having a normally generally horizontal wall member containing a food dispensing opening,

a food container above said wall member having separate food compartments for receiving food to be dispensed, and each having a bottom opening closed by said wall member,

means mounting said container on said frame for movement of said compartments in succession through a dispensing position wherein the bottom opening of each compartment registers with said dispensing opening to effect emptying of the compartment contents through said dispensing opening into a feeding receptacle positioned below said dispensing opening,

a motor for driving said container in said movement, and

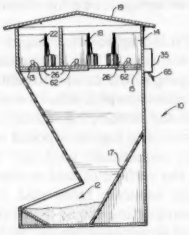
means for periodically energizing said motor to effect movement of said compartments to said dispensing position in succession at predetermined time intervals, said energizing means comprising switch means adapted to be actuated to energize and de-energize said motor, first switch actuating means for periodically actuating said switch means at preset time intervals to energize said motor at said intervals, and second switch actuating means movable in unison with said container for actuating said switch means to de-energize said motor upon arrival of each compartment at its dispensing position.

3,900,008

AUTOMATIC SEQUENCE UNIT FOR PRODUCT FEEDING TO LIVE STOCK

Jimmy Gray Jinnette, 2137 Sunset River Dr., Jacksonville, Fla. 32211

Filed May 16, 1974, Ser. No. 470,641
Int. Cl. A01k *5/02*
U.S. Cl. 119—51.13 **6 Claims**



1. An electric time clock with a set point contact control connected to a power source for sequentially timed product discharge at set desired periods according to manually set periods of the said clock set point control comprising a housing having a feed area, a plurality of feed storage boxes in said housing, door means for each of said boxes, said boxes containing predetermined quantities of a product to be dispensed to the feed area of the housing, door operating solenoid and switch means connected in said timer circuit, whereby said set point contact control sequentially produces electric current to arm and release each solenoid to open said storage doors at the desired set period of the electric time clock.

3,900,009

RESTRAINING DEVICE

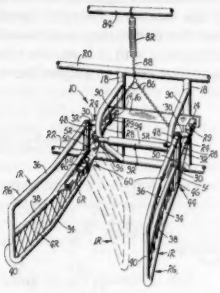
Antonio A. Rodrigues, 8302 18th Ave., Lemoore, Calif. 93245

Filed May 23, 1974, Ser. No. 472,845
Int. Cl.[2] A01K *3/00*
U.S. Cl. 119—96 **9 Claims**

1. In a restraining device for substantially confining a milch cow during milking operations, the improvement comprising: at least one elongated restraining rail for imparting lateral support for a milch cow, including a base end portion and a distal end portion, said distal end portion being pivotally supported by said base end portion for oscillatory motion about a pivotal axis interposed between the opposite ends of the rail and orthogonally related to the longitudinal axis

thereof; and

manually operable locking means for releasably securing



the distal end portion of said rail against oscillatory motion about said pivotal axis.

3,900,010

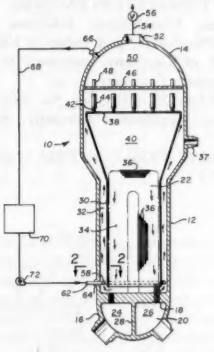
METHOD AND APPARATUS FOR REVERSE CIRCULATING NUCLEAR STEAM GENERATOR SECONDARY FLUID

Fred Zwald Stiteler, New Hartford, and Ronald Louis Honigmann, Ellington, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 19, 1974, Ser. No. 462,270

Int. Cl. F22b *1/06, 37/48*

U.S. Cl. 122—32 **10 Claims**



1. A method of inducing fluid circulation on the secondary side of a steam generator of the tupe including an outer vessel and a vapor generation chamber having an annular baffle means dividing the chamber into an outer annular downcomer passage and an inner riser section, wherein the fluid level is said steam generator is above said annular baffle means, comprising the step of: introducing gas into the lower end of the annular downcomer passage, whereby said gas bubbles up the downcomer passage creating a region of fluid density in the downcomer passage less than the fluid density in the inner riser section, the density differential therebetween inducing a natural circulation of the fluid down the inner riser section and into and up through the downcomer passage.

6. Apparatus for inducing fluid circulation on the secondary side of a steam generator of the type including an outer vessel and a vapor generation chamber having an annular baffle means dividing the chamber into an outer annular downcomer passage and an inner riser section, wherein the fluid level is above said annular baffle means, comprising: means for introducing gas into the lower end of the annular downcomer passage, whereby said gas bubbles up the downcomer passage creating a region of fluid density in the annular downcomer passage less than the fluid density in the inner riser section, the density differential therebetween inducing a natural circulation of the fluid down the inner riser section and into and up through the downcomer passage.

3,900,011

AIR SUPPLY MEANS FOR A FURNACE

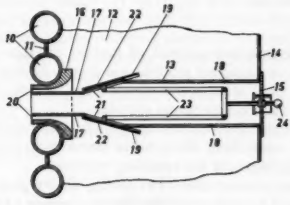
Hans Stenlund, Molndal, Sweden, assignor to Gotaverken Angteknik AB, Goteborg, Sweden

Filed May 2, 1974, Ser. No. 466,503

Claims priority, application Sweden, May 25, 1973, 73073678

Int. Cl. F22b *37/00*

U.S. Cl. 122—235 B **1 Claim**



1. In an air supply means for a furnace defined by walls having air passages, at least one air box fitted outside one of said walls and defined by at least one wall remote from the said one furnace wall for supplying air to a number of said passages, a control means at each of said passages including a sleeve having an end portion extending into the passage and having a narrower cross sectional area than that of the passage, to leave an annular clearance around its perimeter through which the air box communicates with the furnace, each of said sleeves extending from the said furnace wall to the said one air box wall, means for hermetically attaching each of the sleeves to the associated air box wall, an inspection opening being provided in the said one air box wall within the location where a sleeve is attached as well as means to close said inspection opening, air passage openings being provided in respective walls of each of said sleeves, adjustable closure means provided on each of the sleeves for cooperating therewith for regulating the flow of air to the furnace by way of the sleeve, wherein each passage is elongated, being considerably higher than wide, and two of its side walls defining a mating sleeve being substantially

parallel, said substantially parallel side walls including inward, parallel portions located at a distance corresponding to the width of the passage, less the clearance, as well as two outward portions located within the air box, and spaced a distance considerably bigger than the distance between the first mentioned portions, said inward and outward portions of each side wall being joined by an intermediate wall portion located at an angle to the said inward and outward portions an air passage opening of the sleeve being located in each of said inclined wall portions, the inclination of said intermediate wall portions being sufficient to permit a cleaning tool insertable through the pertaining inspection opening in the said air box wall to reach the clearance between the sleeve and the passage from inside the sleeve.

3,900,012

FUEL-AIR MIXTURE PROPORTIONING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

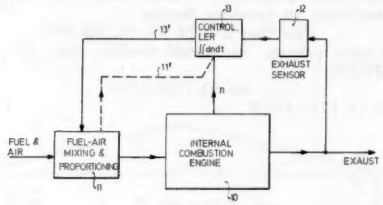
Josef Wahl, Stuttgart, and Peter-Jurgen Schmidt, Schwieberdingen, both of Germany, assignors to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed Feb. 21, 1974, Ser. No. 444,486

Claims priority, application Germany, Apr. 28, 1973, 2321721

Int. Cl.[2] F02D *35/00*

U.S. Cl. 123—32 EA **11 Claims**



1. Proportioning control of fuel-air mixture composition applied to an internal combustion engine having

means (**12**) sensing the composition of exhaust gases and providing an electrical signal;

controllable means (**11**) applying fuel and air to the engine and controlling the relative proportion of fuel and air components of the resulting mixture;

an integral controller (**13**) having an integrator (**16**) connected to and controlled by the sensor (**12**) and being connected to and controlling said controllable means (11) to process the electrical signal and controlling operation of said controllable means to provide a mixture resulting in minimum noxious components in the exhaust of the engine,

wherein the improvement comprises

means (**36**) providing an electrical pulse signal having a pulse repetition rate representative of engine speed, the pulses being of a predetermined pulse time duration,

switching means (**15**) connected to the integrator (**16**) and controlled by said engine speed signal to command the integrator to integrate in steps in synchronism with engine speed during the pulse time;

and wherein the integration rate of said integration steps occurring during said predetermined pulse time is high with respect to the integration rate during pulse gaps.

3,900,013

ELECTRONIC SYSTEM TO CONTROL OPERATOR CIRCUITS AS A FUNCTION OF SPEED OF MACHINE ROTATING MEMBER

Pietro Vignozzi, Rome, and Paolo Cerioli, Bologna, both of Italy, assignors to Fabbrica Italiana Magneti Marelli S.p.A., Milan, Italy

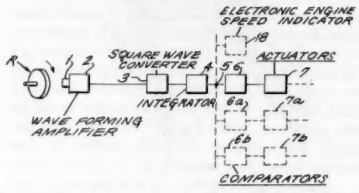
Filed Mar. 28, 1973, Ser. No. 345,675

Claims priority, application Italy, Mar. 28, 1972, 22461/72

Int. Cl. F02p *11/00*

U.S. Cl. 123—102 **15 Claims**

1. An electronic apparatus for controlling at least one operating circuit according to the revolving speed in r.p.m. of a rotating member coupled to a machine, said rotating member being rotated at a speed which varies as a rotational speed in r.p.m. of the machine varies, characterized by comprising in combination: pulsing means, cooperating with the rotating member, for providing square wave signals at first and second outputs, said signals having a constant average value and a frequency which varies as the revolving speed of said rotating member varies; converter means for receiving said signals from one of said first and second outputs, which signals have a constant average value and converting said signals to square wave signals having the same frequency, but variable average value; integrator means for receiving said signals having a variable average value from said converter and converting these signals to a continuous signal which varies linearly with the frequency of the converter output signal; at least one comparator means for comparing said variable continuous signal from said integrator with at least one reference (threshold) signal having a value equal to a signal from said integrator



corresponding to a given r.p.m. of the machine (or given r.p.m. of the rotating member), each of said comparator means adapted to provide a control signal at an output thereof when the variable signal exceeds the reference signal associated with that comparator means; control means for acting on each of the operating circuits when energized by at least one of the control signal outputs of the comparator means; said control means being adapted to short-circuit the remaining of the first and second outputs of said pulsing means coupled to one of said operating circuits.

3,900,014

FUEL METERING DEVICE FOR INTERNAL COMBUSTION ENGINES

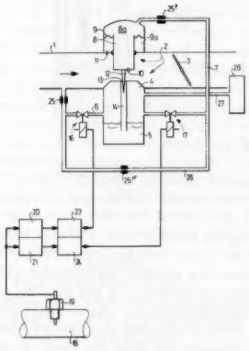
Lorenz Bundesen, Munchingen; Johannes Brettschneider, Ludwigsburg-Pflugfelden, and Heinrich Knapp, Leonberg-Silberberg, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed July 25, 1973, Ser. No. 382,368

Claims priority, application Germany, Sept. 15, 1972, 2245418

Int. Cl. F02m *7/00;* **F02d** *33/00*

U.S. Cl. 123—119 R **6 Claims**



1. In a fuel metering device for an internal combustion engine having an air-intake suction tube and an exhaust pipe, the device comprising, a carburetor having a fuel reservoir within which an air space is defined and including a fuel line leading from the fuel reservoir to the air-intake suction tube, and a measuring sensor located within the exhaust pipe and adapted for detecting the composition of the exhaust gas

produced by the engine and emitting corresponding intermittent output signals, wherein the amount of fuel metered into a given amount of air flowing through the suction tube is determined by the air pressures in the air space of a fuel reservoir and in said suction tube as well as by the output signal of the measuring sensor, the improvement comprising, in combination,

a. air pressure measuring sources connected at least at two locations to the suction tube for detecting differences in air pressure in said suction tube,
b. communicating means connected between said sources and to said air space,
c. means connected to said measuring sensor and to said communicating means for controlling air flow from said sources through said communicating means as well as the air pressure in said air space in said fuel reservoir by means of intermittent output signals emitted by said sensor,
d. means defining an air chamber, and
e. means connecting the air chamber to said air space, wherein said air chamber serves to smoothen the air fluctuations in said air space.

3,900,015

SPARK IGNITION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

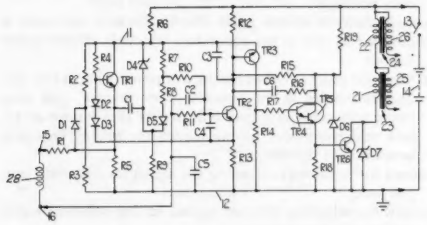
David Mainprize, Polesworth, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Filed May 30, 1973, Ser. No. 365,153

Claims priority, application United Kingdom, June 14, 1972, 27788/72

Int. Cl.² F02P *3/06*

U.S. Cl. 123—148 E **8 Claims**



1. A spark ignition system for an internal combustion engine comprising a pick-up driven by said engine which produces an output voltage waveform, a trigger circuit controlled by said pick-up to produce sparks when triggered, means for applying a bias to said output waveform, means for varying said bias up to a predetermined maximum in accordance with the amplitude of said waveform produced by said pick-up, said bias applying means and bias varying means further causing said trigger circuit to be triggered at a substantially constant point in said pick-up waveform up to a predetermined speed of said engine and for causing an advance in timing in proportion to increasing engine speed above said predetermined speed.

3,900,016

CAPACITOR DISCHARGE IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Georg Haubner, Berg; Walter Hofer, Schwabach, and Peter Schmaldienst, Nurnberg, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Feb. 4, 1974, Ser. No. 439,011

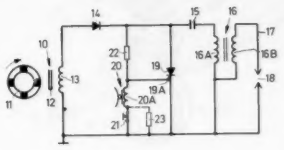
Claims priority, application Germany, Mar. 16, 1973, 2313273

Int. Cl.² F02P *1/17*

U.S. Cl. 123—148 CC **13 Claims**

1. Electronically controlled ignition system of the capacitor-discharge type for an internal combustion engine, comprising, in combination with a magneto generator (**10**), an ignition transformer (**16**) having low and high voltage windings, spark-timing pulse generator means (**20**), at least one spark plug (**18**) in circuit with said high-voltage winding, and control circuit means including the following:

a capacitor (**15**) and a controlled semiconductor switch (**19**) arranged in circuit, so that said capacitor may be charged by said magneto generator (**10**) and discharged through said semiconductor switch (**19**) and said low-voltage winding (**16A**) of said transformer, said controlled semiconductor switch having a control electrode, and



ignition disabling means (**21**) in circuit both with said spark-timing pulse generator and with the control electrode of said controlled semiconductor switch, so connected as to produce, when said disabling means is put into disabling position, a voltage on said control electrode that, by the time the next charging halfwave of said magneto generator begins, at the latest, causes said controlled semiconductor switch to short-circuit the discharge circuit of said capacitor (**15**).

3,900,017

SPARK IGNITION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

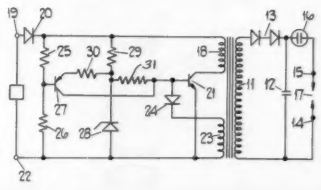
Keith Douglas Collins, Watford, England, assignor to Lucas Aerospace Limited, Birmingham, England

Filed June 24, 1974, Ser. No. 482,278

Claims priority, application United Kingdom, June 29, 1973, 31082/73

Int. Cl.² F02P *3/06*

U.S. Cl. 123—148 E **8 Claims**

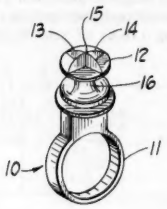


1. A spark ignition circuit for an internal combustion engine comprising a transformer having a secondary winding, a capacitor, a rectifier through which the capacitor is charged from the secondary winding, a pair of output terminals across which in use, is connected a spark plug, a voltage sensitive device connecting one plate of the capacitor to one of the output terminals, the other plate of the capacitor being connected to the other output terminal, a pair of DC supply terminals for connection in use, to a source of DC supply, a transistor, a primary winding on the transformer said primary winding being connected to the DC supply terminals through the collector emitter path of the transistor, a resistor for providing base drive to the transistor, a feedback winding on the transformer, said feedback winding being operable to cause switching of the transistor, and means responsive to the supply voltage for varying the effective value of said resistor, said means including a further transistor the conduction of which is dependent upon the supply voltage.

3,900,018
MOSQUITO-BITE ITCH STOPPER

Carmen Piunno, South Euclid, Ohio, assignor to The Human Circle, Inc., South Euclid, Ohio

Filed Jan. 11, 1974, Ser. No. 432,550
Int. Cl. A61b 19/00
U.S. Cl. 128—1 R 2 Claims

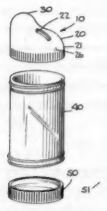


1. A mosquito-bite itch stopper, comprising in combination, a base having a handle at one end and a flat surfaced platform at the other end extending in a plane at 90° to the longitudinal axis of the base; a first, upstanding arcuate fin mounted diametrically of the platform; and, a second upstanding arcuate fin mounted diametrically of the platform at 90° to the first fin; the two fins intersecting at their midpoints to define an upstanding crescent-cross adapted to be pressed against the surface of a bite and create high unbalanced pressures within the bite itself, thereby dispersing the irritant through a larger volume of skin tissue, to dilute the concentrated irritant and stop the itching.

3,900,019
URINE SAMPLING DEVICE AND METHOD

Barbara Ann Logiadis, 116 Pinehurst Ave., Apt. J-24, New York, N.Y. 10033

Filed Aug. 23, 1973, Ser. No. 390,895
Int. Cl. A61b 10/00
U.S. Cl. 128—2 F 14 Claims



1. A one-piece cap of smooth, impermeable, heat sterilizable material for use with a collection container for taking a human female urine specimen comprising:

a dome-like major surface in the form of an oblate hemispheroid terminating in a cylindrical skirt sized to fit the top of a specimen container;

an eccentric generally hemispherical protrusion having a diameter about half the skirt diameter and located to one side of and extending above the apex of the major surface;

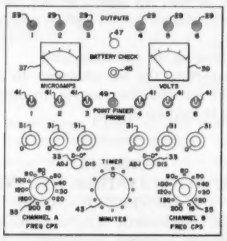
an intermediate surface smoothly blending the base of the protrusion into the major surface; and

an elongated slot through the major surface communicating with the interior of the cap and extending from about the center of the major surface radially away from the eccentric protrusion, the protrusion being adapted to occlude the vaginal opening of a female person when pressed thereagainst to prevent vaginal secretions from contaminating the specimen, the width of the slot being adapted to encompass the urethral meatus, and the length of the slot being at least equal to the perineal distance from the vaginal opening to the urethral meatus for the normal range of human female anatomy.

3,900,020
ELECTRONIC ACUPUNCTURE DEVICE

Chuck Lock, 156 8th Ave., San Francisco, Calif. 94118

Filed May 2, 1974, Ser. No. 466,125
Int. Cl.[2] A61B 5/05; A61N 1/32
U.S. Cl. 128—2.1 C 5 Claims



1. An electronic acupuncture device for use in acupuncture research comprising

an a.c. signal generator and at least one transformer having a primary winding which is connected to the output of said signal generator and having a multiplicity of secondary windings,

a multiplicity of output jacks wherein each of said jacks is coupled to one of the secondary windings of said transformer,

at least one pair of probes having a common plug at one end and electrodes at the opposite ends thereof, said plug being releasably engaged with one of said output jacks, and said electrodes having means for fixably engaging acupuncture needles,

means for separately adjusting the signal level at each output jack,

means for selecting between signals having different waveshapes and frequencies,

means for individually measuring the signal level at each pair of probes whereby the parameters of the signal used in the acupuncture treatment can be measured and recorded,

a timer means for automatically turning off the signal from said signal generator after a preset operation time, and

means for locating before treatment the desired acupuncture points on the patient's body.

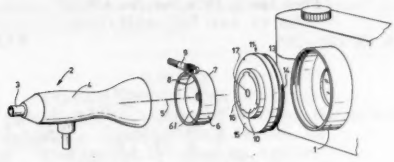
3,900,021
COUPLING FOR ENDOSCOPES AND INSTRUMENTS PARTICULARLY CAMERAS

Anthony Peter Walter Makepeace, Steep Acre, Tower House Ln., Wraxall, Bristol, and Huw Bevan Griffith, 19 Kingsweston Rd., Henbury, Bristol, both of England

Filed July 3, 1973, Ser. No. 376,223
Claims priority, application United Kingdom, July 4, 1972, 31295/72
Int. Cl. A61b 1/04
U.S. Cl. 128—4 2 Claims

1. In combination, an endoscope having an elongate probe portion and a collar at the rearward end of the probe portion, said collar having a rearwardly flared end part, a camera having a lens surround, said lens surround being internally threaded, a first component comprising a clip having an annular end wall and a side wall shaped to embrace at least part of

the rearwardly flared end part of the collar portion, said side wall being split and being provided with screw means whereby it may be tightened about the rearwardly flared end part of the collar portion, said first component being formed from a magnetic material, and a second component having an end wall with an external screw thread adapted to screw into the lens surround and having a central aperture, a recess in the end wall, and an annular permanent magnet fitted within the



recess with the aperture in the magnet in line with the aperture in the end wall, wherein the recess in which is disposed the magnet is defined within a circular rib and the clip has a circular lip defining a relatively wide shallow cavity, the lip being adpated to embrace the rib and to limit relative movement of the endoscope and camera in the transverse direction, while at the same time permitting separation of the endoscope and camera in response to jerking by a patient.

3,900,022

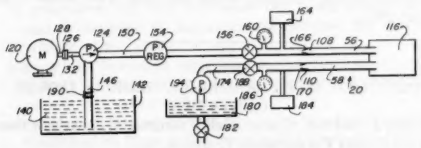
ENDOSCOPE WITH UNINTERRUPTED FLOW PURGING SYSTEM

Jerrold Widran, 60 State Dr., Glencoe, Ill. 60022

Filed Dec. 10, 1973, Ser. No. 423,489

Int. Cl.[2] A61B *1/06;* **A61M** *1/00*

U.S. Cl. 128—7 **1 Claim**



1. In an endoscope including conduit means insertable longitudinally into a restricted passage communicating with a body cavity for transmittal of a fluid stream through said passage and into and from a zone of treatment subjected to a surgical technique,

tissue treatment means including means for removing tissue from said zone,

optical means for viewing said zone,

means for illuminating said zone,

means for selectively manipulating said tissue treatment means in carrying out said surgical technique,

pump means for driving fluid through said conduit means for said zone of treatment, thereby to establish a continuous fluid flow circuit for passage of fluid into and discharge of fluid from said zone of treatment in an uninterrupted stream, and

fluid impelling means distinct from said pump means the improvement comprising:

flow rate synchronization means operable functionally in a series flow path including a zone of treatment to synchronize said fluid impelling means volume-wise with said pump means to preclude pressure buildup in said zone of treatment by reason of fluid forced into said zone of treatment, and to obviate collapse of said body cavity as a result of fluid evacuation therefrom.

3,900,023

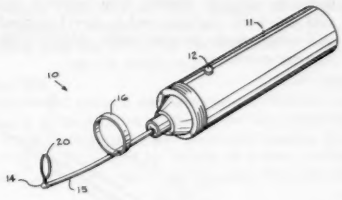
SUPPORT AND EXCITER DEVICE

Ralph J. McBride, 6002 Marinette, Apt. No. 913, Houston, Tex. 77036

Filed Nov. 1, 1974, Ser. No. 519,815

Int. Cl.[2] A61H *1/00;* **A61F** *5/00*

U.S. Cl. 128—36 **4 Claims**



1. In a device for imparting vibratory motion to an organ of a user, the combination of:

a combination hand grip portion and source of vibrations;

a support member affixed to and extending outward of said housing;

a flexible member linked to said support member near said members end opposite from said housing; and

guide means provided said support member intermediate said housing and said flexible members end, said flexible member and said guide means forming means for holding portions of the organ to the support member.

3,900,024

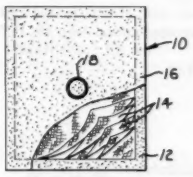
ORTHOPEDIC CAST AND METHOD OF CONSTRUCTING SAME

Leo E. Lauber, 821 Locust, Eudora, Kans. 66025, and Ernest A. Cowden, 7405 Sloan, Kansas City, Kans. 66109

Filed Jan. 28, 1974, Ser. No. 437,522

Int. Cl. A61f *5/04*

U.S. Cl. 128—91 R **5 Claims**



1. A method of constructing a casting blank from which a plaster cast for a portion of the body may be formed, said method comprising: providing a first, outermost sheet of resilient, cellular water absorptive material; deposting at least one plaster splint on said sheet; providing a second outermost sheet of deformable water absorptive material; placing said second sheet in overlying relationship to the plaster on the first sheet; and joining the peripheral edges of said first and second sheets to encase said plaster therewithin.

3,900,025

APPARATUS FOR DISTRACTING OR COMPRESSING LONGITUDINAL BONE SEGMENTS

Walter P. Barnes, Jr., 830 Wimbish Rd., Macon, Ga. 31204

Filed Apr. 24, 1974, Ser. No. 463,463

Int. Cl. A61f *5/04;* **A61b** *17/18*

U.S. Cl. 128—92 D **15 Claims**

1. An orthopedic apparatus of a size for implantation within a limb in direct contact with a bone for selectively positioning

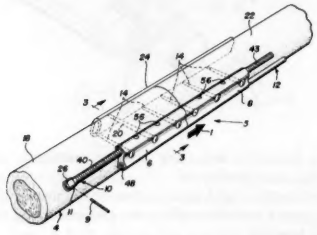
contiguous longitudinal bone segments, said apparatus comprising:

a first elongated support member;

a second elongated support member;

means on said first support member for placement longitudinally adjacent one of said bone segments in direct contact therewith;

means on said second support member for placement longitudinally adjacent another bone segment contiguous to said one bone segment and in direct contact therewith and substantially longitudinally aligned with said first support member;



means for releasably mounting said first and second support members to said bone segments;

a manually operable adjusting member;

means on said first and second support members for imparting longitudinal movement to one of said support members in response to operation of said adjusting member and for maintaining substantial longitudinal alignment of said first and second support members; and,

means for preventing rotational movement of said first and second support members during said longitudinal movement thereof.

3,900,026

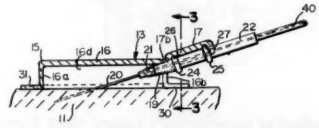
DEVICE FOR HOLDING AND PROTECTING INTRAVENOUS INJECTION NEEDLES

William H. Wagner, 5405 W. Eva St., Glendale, Ariz. 85301

Continuation-in-part of Ser. No. 417,111, Nov. 19, 1973, abandoned. This application Aug. 19, 1974, Ser. No. 498,254

Int. Cl.[2] A61M *5/00*

U.S. Cl. 128—133 **1 Claim**



1. A device for securely holding and protecting an intravenous injection needle when said needle is inserted in a body part of a patient, said device being substantially transparent to permit visual inspection of said needle and its condition of insertion at all times and comprising a moderately rigid cover or bubble cap member of resilient plastic material adapted to overlie and cover a said needle inserted at a proper angle into said body part, said cover or cap member including integral needle locking means for securing a separable tapered friction joint between said needle and a conventional supply tube therefor, said locking means comprising a neck or extension element of channel section integrally connected to said cap or cover through a flexible hinge, the channel section being shaped to snugly engage and hold both a flange or collar on the needle and a flange or collar on the supply tube to prevent relative movement and inadvertent separation of said needle from the tube, said flexible hinge being formed to permit angular movement of said neck or extension to accommodate said proper angle of needle insertion into the body part, and flange elements on said cover for resting on the surface of said body part.

3,900,027

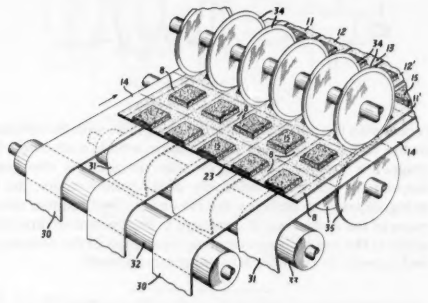
PROCESS FOR PREPARING INTEGRAL ABSORBENT PAD BANDAGES AND PRODUCT

Cyril A. Keedwell, Lovedean, England, assignor to Pall Corporation, Glen Cove, N.Y.

Filed Jan. 2, 1974, Ser. No. 430,327

Int. Cl. A61f *7/02*; **A61l** *15/00*

U.S. Cl. 128—268 **8 Claims**



1. An integral absorbent pad bandage that is all in one piece of shaped nonwoven monolayer thermoplastic fibrous sheet material, comprising a nonwoven thermoplastic fibrous sheet material the fibers of which are self bonded together to define a unitary sheet of fibrous material formed into compressed edge and tab portions having a reduced thickness and porosity below 50% delimiting an absorbent pad portion of greater thickness having a porosity within the range from about 50 to about 98%.

3,900,028

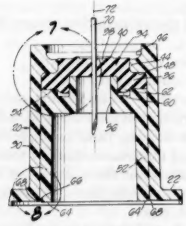
INJECTION SITE FOR STERILE MEDICAL LIQUID CONTAINER

Charles J. McPhee, Sylmar, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Feb. 26, 1974, Ser. No. 445,852

Int. Cl.[2] A61J *1/00*

U.S. Cl. 128—272 **19 Claims**



1. A container connected to a tube that has a puncturable resealable diaphragm secured within this tube, wherein the improvement comprises:

a container with a preformed opening therein; a closure with a rigid transverse wall spanning the container opening, with a periphery of the closure joined to the container at a hermetic seal; said transverse wall having an opening that is substantially smaller than the container

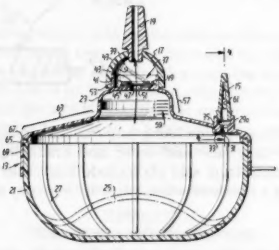
opening and spaced from said hermetic seal; a rigid tube integrally formed with the transverse wall without any seam or joint therebetween, said tube having a passage communicating with the transverse wall opening; an inwardly extending flange integrally formed with the tube without any seam or joint therebetween; and a tubular retainer within said tube and spaced from said heremetic seal; said retainer, rigid tube, and flange combining to confine the diaphragm, and said retainer and flange engaging the diaphragm to form a hermetic seal whereby all external joints between the container and closure are remote from the diaphragm.

3,900,029

CLOSED SURGICAL EVACUATOR

Irving Melnick, Danville, and George W. Oakes, Boston, both of Va., assignors to Irving Melnick, Danville, Va.

Filed Oct. 26, 1973, Ser. No. 410,240
Int. Cl. A61m *1/00*
U.S. Cl. 128—278 **14 Claims**



1. A surgical evacuator for draining fluids from the body of a patient comprising:

an evacuator bag, said evacuator bag being compressible and expandable to decrease and increase the internal volume of the evacuator bag;

a drain inlet formed in said evacuator bag for connection to a drain tube adapted to drain fluids from the body of a patient into said evacuator bag;

a purge port formed in said evacuator bag for evacuating fluids and air from said evacuator bag when said evacuator bag is compressed; and,

a magnetic purge valve, said magnetic purge valve being a one-way valve mounted so as to allow fluid and air to exhaust from said evacuator bag through said purge port when said evacuator bag is compressed, said magnetic purge valve rapidly closing upon termination of said compression so as to prevent contaminants from entering the bag through said purge port, said magnetic purge valve comprising:

a valve-seat formed on said evacuator bag about said purge port, said valve seat including a ferromagnetic portion surrounding said purge port; and,

a valve-closure member being hingedly attached adjacent said purge port so as to be movable between a closed position flat against said valve seat and an open position moved away from said valve seat, said valve-closure member comprising a ferromagnetic portion and a resilient membrane portion, said ferromagnetic portion and said resilient membrane portion being associated and attached to one another so as to form a flexible resilient membrane spanning said exhaust port, said spanning portion of said resilient membrane being unsupported by a rigid member so that it is free to flex into said exhaust port in response to a decrease in pressure in said evacuator bag and thereby be pulled tightly over an edge of said valve seat when said valve-closure member is in said closed position;

one of said valve-seat ferromagnetic portion and said valve-closure member ferromagnetic portion being permanently magnetized.

3,900,030

CATAMENIAL TAMPONS

Robert N. Bashan, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 10, 1974, Ser. No. 477,564
Int. Cl. A61f *13/20*
U.S. Cl. 128—285 **4 Claims**

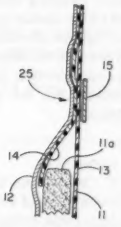
1. In a catamenial tampon the improvement which comprises employing as the sorptive medium a flexible hydrophilic opencelled foam having uniformly dispersed therein from about 15 to about 30 percent by weight of a finely divided water-swellable polymer having a gel capacity of at least 10.

3,900,031

DISPOSABLE DIAPER WITH REINFORCED WAISTBAND AND TAPE ATTACHMENT MEANS

Dan D. Endres, Appleton, and Esther M. Lafond, Winnebago, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 22, 1974, Ser. No. 499,437
Int. Cl.[2] A41B *13/02*; **A61F** *13/16*
U.S. Cl. 128—287 **2 Claims**



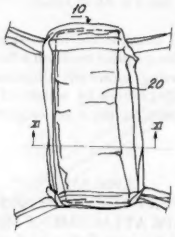
1. An improvement in a disposable diaper in which the sealed side edges of the diaper provide leg-encircling means and the sealed ends of the diaper provide a body-encircling waistband, said diaper being of the type which comprises an absorbent filler sandwiched between a fluid-permeable cover and a thermoplastic film backing and which also has a narrow thermoplastic film strip internally disposed between said cover and said backing at the ends and which film strip is heat-sealed to said cover and said backing across said ends forming the waistband, said improvement comprising a structure in which one end of said filler is short of one heat-sealed end leaving a narrow filler free section at that end, said filler free section having a small laminated area at the edges of the diaper adjacent the short filler end, said laminated area being formed by heat-sealing the cover sheet, backing sheet and film strip together in that area, said laminated area extending inward from the diaper edges about 1 to 2 inches and being about three-eighth to five-eighth inch wide, said diaper being provided with pressure-sensitive adhesive tape strips with one end of a strip of said pressure-sensitive adhesive tape being affixed to said backing in each of said laminated areas and the other end of said strip extending beyond the respective diaper edge.

3,900,032

HOLDER FOR ABSORBENT PADS, SUCH AS INFANTS NAPKINS

Olof Torgny Heurlen, Sandasvagen 4, S-191 45 Sollentuna, Sweden

Filed Feb. 6, 1974, Ser. No. 440,175
Claims priority, application Sweden, Feb. 9, 1973, 7318822
Int. Cl. A61f 13/16
U.S. Cl. 128—290 H 10 Claims



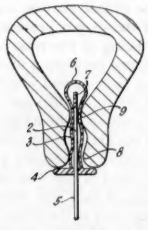
1. A holder for an elongated absorbent pad intended to be secured to the body, for instance by being tied therearound, comprising a substantially rectangular center portion formed from a thin flexible sheet material, said center portion being extended in the longitudinal direction of the pad, and plural striplike fastening portions fixed to and extending from the corners of said center portion, the improvement wherein opening means in the form of holes or slits are formed in the center portion adjacent the corners thereof, and the free end of each strip portion being threaded into and the strip portion pulled through the adjacent opening means, the two strip portions adjacent each end of the center portion being pulled away from one another in opposite directions to tension said strip portions and cause twisting of the adjacent longitudinally extending edges of the center portion so that said center portion assumes a troughlike form for accommodating an elongated absorbent pad therein.

3,900,033

DILATOR FOR CERVICAL CANAL

Robert Irvin Leininger; Joseph Ronald Preston, and Brenton Ray Lower, all of Columbus, Ohio, assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Mar. 7, 1973, Ser. No. 338,697
Int. Cl. A61m 29/00
U.S. Cl. 128—344 10 Claims



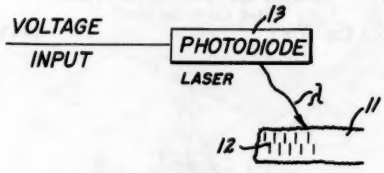
1. A body canal dilating device comprising a relatively non-elastic, non-expansible, collapsible, inflatable envelope, having two portions, the first said portion in the inflated state having a relatively constant diameter and a length sufficient to occlude a canal having more than one os, and the other of said portions contiguous with the first said portion and being a terminal enlarged bulbous portion having a diameter in excess of said constant diameter in the inflated state, a tubular inserter member entering the first said portion and while inside thereof extending therethrough and into the inside of the other of said portions, a shield located in proximity of the entrance to the first said portion and engaged with said tubular member, said tubular member being adapted to permit entry into said envelope of a pressurizing fluid.

3,900,034

PHOTOCHEMICAL STIMULATION OF NERVES

Joseph J. Katz, Chicago, and Thomas R. Janson, Joliet, both of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 10, 1974, Ser. No. 459,756
Int. Cl.[2] A61N 1/00
U.S. Cl. 128—395 8 Claims



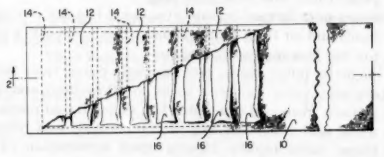
1. A method of stimulating a nerve comprising: placing a photodiode laser near said nerve; and irradiating said nerve with the output from said photodiode laser, said photodiode laser having a nondestructive intensity; whereby said nerve is stimulated.

3,900,035

THERAPEUTIC ELASTIC BANDAGE

Dennis W. Welch, 3595 Post Rd., Apt. 17301, Warwick, R.I. 02888, and Milton H. Lipsky, 26 Francis Dr., Randolph, Mass. 02368

Filed July 3, 1974, Ser. No. 485,356
Int. Cl.[2] A61F 7/00, 7/04
U.S. Cl. 128—402 6 Claims



1. A therapeutic elastic bandage for cold or heat treatments comprising an elastic bandage formed of textile covered elastic threads and having a plurality of spaced pockets, an elastic flexible latex bag positioned in each of said pockets, and a filling in said bags for providing cold or heat.

3,900,036

CORN HUSKING MACHINE

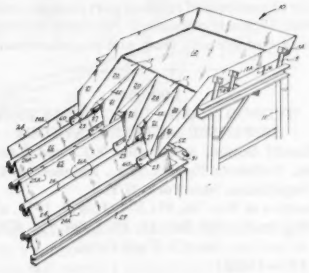
Ronald L. Anderson, 1698 Best Ln., Eugene, Oreg. 97401, and Harry T. Kessler, Jr., 4460 Mill, Eugene, Oreg. 97405

Filed Oct. 3, 1974, Ser. No. 511,621
Int. Cl. A01f 7/02
U.S. Cl. 130—5 D 5 Claims

1. In a food article processing machine having a plurality of chutes down which elongate food articles travel during processing, pairs of upper and lower inclined rolls acting jointly on the chute delivered articles, pairs of elongate panels oppositely adjacent each pair of cooperating rolls confining food articles for passage along the rolls during which passage mate-

rial is removed from each article by concerted roll action, means powering said rolls, the improvement comprising,

flexible pad members mounted intermediate each pair of panels, said pad members located subjacent the discharge end of each chute for reception of chute discharged food articles, at least one panel of each pair of panels being pivotally mounted on said machine and subjected to



oscillating motion, said flexible pad members partaking of said motion and operable to discharge the elongate food articles lengthwise on their sides upon the uppermost roll of each pair of inclined rolls to initiate removal of material from the article, said flexible pad members additionally serving to yield to a food article momentarily propelled thereagainst by roll action thereby avoiding article damage.

3,900,037

TOBACCO-SMOKE FILTERS

Henry George Horsewell, Totton, and John Anthony Luke, Woodlands, both of England, assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Continuation of Ser. No. 95,370, Dec. 4, 1970, abandoned. This application Nov. 27, 1972, Ser. No. 309,691

Claims priority, application United Kingdom, Dec. 24, 1969, 062825/69

Int. Cl. A24c *5/50*

U.S. Cl. 131—10 **10 Claims**

1. A tobacco smoke filter comprising a rod formed from a sheet of tobacco smoke filter paper, said sheet having a surface coating of from about 5 to about 25% by weight, based on the weight of the paper, of cellulose acetate.

3,900,038

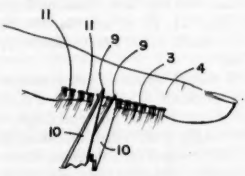
METHOD OF PREPARING AND PLACING ARTIFICIAL EYELASHES

George Masters, Las Vegas, Nev., assignor to Beauty Masters, Ltd., Las Vegas, Nev.

Filed Mar. 19, 1974, Ser. No. 452,625

Int. Cl.[2] A41G *3/00*

U.S. Cl. 132—5 **9 Claims**



1. A method of preparing prefabricated artificial eyelashes having hairlike fibers extending outwardly from a flexible base member which comprises cutting the base member into a plurality of sections having section lengths of ¼ inch to ½ inch.

3,900,039

METHOD OF PRODUCING SHAPED SEMICONDUCTOR BODIES

Wolfgang Dietze; Manfred Schnöller; Tomislav Mladenovich, and Werner Baumgartner, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 29, 1973, Ser. No. 410,890

Claims priority, application Germany, Oct. 31, 1972, 2253498

Int. Cl. B08b *9/00; C23c 11/06*

U.S. Cl. 134—3 **2 Claims**

1. In a method of producing a tube composed of silicon wherein a gaseous thermally decomposable silicon compound is brought into contact with a tubular carrier member composed of graphite so that a layer of silicon is deposited in a desired thickness about the peripheral surface of the carrier member which is then removed without destroying the so-formed silicon tube, the improvement comprising:

whereby the so-formed silicon tube is removed at room temperature by subjecting the silicon-coated carrier member to 100% fuming nitric acid and flushing the so-formed silicon tube with water to remove any residual material of said carrier member remaining in the silicon tube.

3,900,040

MACHINE FOR CLEANING CONTAINERS

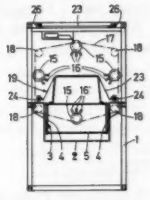
Andreas Graber, and Claus Hörr, both of Oftringen, Switzerland, assignors to Niro-Plan AG Oftringen, Oftringen, Switzerland

Filed Mar. 6, 1974, Ser. No. 448,481

Claims priority, application Switzerland, Mar. 13, 1973, 3660/73

Int. Cl. B08b *3/02, 9/08, 11/02*

U.S. Cl. 134—127 **2 Claims**

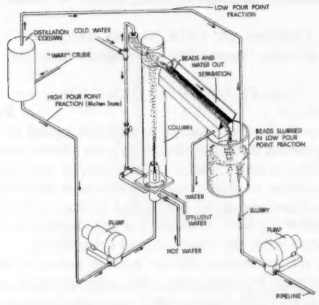


1. A machine for cleaning articles to be washed, particularly containers, having a conveyor running within a framework to carry the containers to be cleaned past at least one set of nozzles connected to a source of high-pressure liquid, wherein an endless, self-contained means running at the same speed as the conveyor is provided for pressing the said containers against the conveyor in the region of the said nozzles, said means for pressing comprises two link belts running over guide members, disposed at a fixed distance from one another at the front and at the rear of the machine, respectively, and a plurality of elastic cords crossing each other under tension from the links of the one link belt to those of the other link belt, the sections of the two link belts adjacent to the bed of the conveyor in the regions of the said nozzles being disposed so close to the said bed that the cords are stretched around the containers which pass beneath them at that point.

3,900,041
MODIFICATION OF PARTICLE HARDNESS IN WAXY CRUDE OIL SLURRIES

Keith M. Kersch; George A. Pouska; Dennis E. Drayer, and James E. Tackett, Jr., all of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed May 13, 1974, Ser. No. 468,969
Int. Cl. F17d *1/16;* **B65g** *53/30;* **C10g** *43/02*
U.S. Cl. 137—13 **26 Claims**

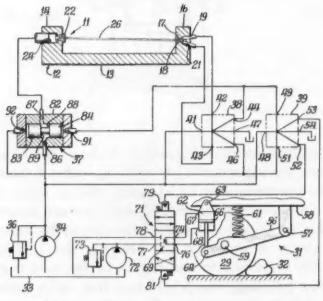


1. In a process for transporting waxy petroleum crudes by fractionating the crude into at least a wax fraction and a liquid fraction, forming substantially round particles of wax, slurrying the wax particles in a liquid hydrocarbon comprised of the liquid fraction and transporting the slurry, the steps comprising introducing molten wax having no substantial crystalline structure into a hot, wax immiscible fluid flowing cocurrent to the introduction of the molten wax and at flow rates sufficient to form substantially round particles having a substantially smooth outer shell and thereafter introducing the wax particles into a colder wax immiscible fluid at a sufficiently low temperature to substantially solidify the wax particles.

3,900,042
FLUIDIC ACCELEROMETER

Dale H. Unruh, and Frederick D. Proksch, both of Peoria, Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Jan. 28, 1974, Ser. No. 437,205
Int. Cl.² F16K *17/36*
U.S. Cl. 137—38 **8 Claims**

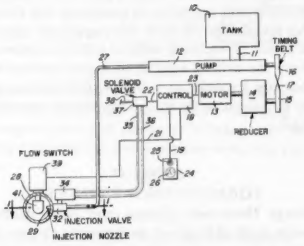


1. A fluidic system for detecting acceleration and for producing an acceleration signal in response thereto comprising:
fluid flow receiver means having a first flow receiving port,
fluid jet forming nozzle means having a flow orifice,
means for supplying fluid under pressure to said nozzle means whereby a fluid jet is ejected therefrom,
support means holding said nozzle means in spaced apart relationship from said receiver means with said jet being directed towards said receiver port across an unobstructed gap,
fluidic signal output means communicated with said first receiving port for generating fluidic signals in response to brief departures of the pressure at said receiverr port receiver a predetermined value, and
compensating means for varying the flow passage to said jet nozzle to restore said receiver port pressure to said predetermined value in response to relatively prolonged departures of said pressure from said predetermined value.

3,900,043
HYDRODYNAMIC DRAG REDUCTION DISPENSER-METERING SYSTEM

James Harold Bowen, Somerville, N.J., and Kenneth John Sollman, Yorktown Heights, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 151,374, June 9, 1971, abandoned.
This application July 16, 1973, Ser. No. 379,706
Int. Cl. F16k *19/00*
U.S. Cl. 137—101.21 **5 Claims**



1. A hydrodynamic drag reduction dispenser metering system for injecting a slurry of a friction reduction agent in a liquid vehicle into a controlled aqueous stream comprising in combination, a dispensing tank for containing and dispensing said slurry, a positive displacement pump associated with said dispensing tank for propelling varying amounts of said slurry, an injection valve attached contiguously to an injection nozzle in contact with said controlled aqueous stream, conduit means communicating with said injection valve and said pump for delivering said slurry from said dispensing tank to said controlled aqueous stream through said injection valve and nozzle, said injection valve being responsive to a positive flow of said controlled aqueous stream through being adapted to close when said positive flow ceases, said injection valve being adapted to provide when required a temporary purge passage from said nozzle to the atmosphere for cleaning gel from said nozzle by back pressure from said controlled aqueous stream.

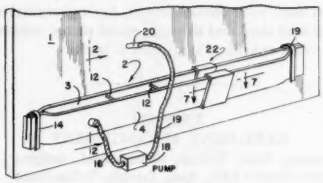
3,900,044
DETACHABLE TROUGH STRUCTURE

Leon Louis Seidman, 503 Elm Ave., Takoma Park, Md. 20013

Filed Sept. 21, 1973, Ser. No. 399,547
Int. Cl.² B05C *5/02, 11/10;* **B05D** *1/26*
U.S. Cl. 137—360 **11 Claims**

1. A detachable trough structure comprising a trough body formed by a first longitudinal wall having a planar outer surface, a top edge, a bottom edge and end edges, and a second longitudinal wall having a top edge, a bottom edge, and two end edges, said walls being of flexible elastomeric material and being secured together along the bottom edge of each wall in an angular spaced relationship to form a trough space therebetween having a generally V-shaped cross sectional configuration, said walls thus forming a triangular trough channel having an open top, a closed bottom, and opposed open ends, said

walls being foldable at their joined bottom edges from their angularly spaced relationship to a position wherein they form a double wall strip for storage purposes, and attaching means



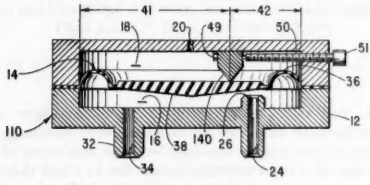
on the planar surface of the first wall for securing the trough structure to a support surface for the collection of a liquid flowing along said support surface above the trough channel.

3,900,045

FULCRUM PRESSURE REGULATOR

Donald K. Murrell, Los Angeles, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Sept. 27, 1973, Ser. No. 401,489
Int. Cl. F16k *31/385*
U.S. Cl. 137—505.38 **7 Claims**



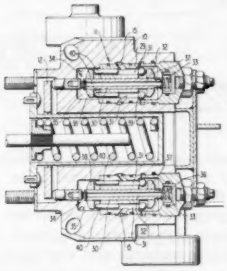
1. A pressure regulator comprising
a casing having inlet means and outlet means;
diaphragm means mounted in said casing to define a pressure chamber communicating with said inlet means and said outlet means;
regulating valve means disposed in said casing and including a valve seat; and
fulcrum means mounted at an off-center position in said casing and with an elongate edge engaging said diaphragm means to define a first control portion of said diaphragm means and a second valve member operating portion thereof, such that the first portion of said diaphragm means has a greater area exposed to pressure in said pressure chamber than the second portion thereof, said second portion of said diaphragm means being movable thereby to cooperate with said valve seat and control fluid flow in said casing whereby said diaphragm means pivots about said fulcrum means as pressure in said pressure chamber varies to move said second valve member operating portion relative to said valve seat and regulate pressure at said outlet means;
said fulcrum means including means movable along and relative to said diaphragm means to change the ratio of the areas of said first and second portions and adjust the regulated pressure at said outlet means.

3,900,046

CONTROL VALVE FOR ACCUMULATOR SYSTEMS, ESPECIALLY FOR SERVO BRAKES OF MOTOR VEHICLES

Manfred H. Burckhardt, Waiblingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 12, 1973, Ser. No. 423,895
Claims priority, application Germany, Dec. 13, 1972, 2260799
Int. Cl. F16k *11/10*
U.S. Cl. 137—596 **17 Claims**



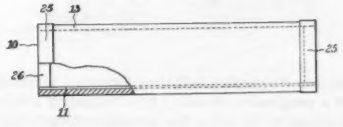
1. A control valve for accumulator installations including a first valve means disposed between a high pressure space and a working space and having valve closure body means operatively connected with a valve seat for a second valve means, said second valve means being disposed between the working space and a discharge and including closure body means actuatable by a control magnitude, and a control slide valve means in an operative connection between the first and second valve means which includes a longitudinal bore between the working space and the second valve means and which is longitudinally displaceable in a sleeve means having a seat for the first valve means, characterized in that plate-shaped abutment means are arranged on the control slide valve means on both sides of the sleeve means, several parallel bores are substantially uniformly distributed adjacent the circumference of the sleeve means substantially concentrically about the control slide valve means, said parallel bores being in communication with the high pressure space and receiving at an end thereof adjacent the working space balls as valve closure means of the first valve means, said balls being supported against one of said abutments, and in that roller body means are inserted into the parallel bores from the other side thereof which are supported against the other abutment means.

3,900,047

ELECTRICALLY HEATED PLASTIC PIPE

Douglas Fraser Heppell, Lake Cowichan, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 21, 1974, Ser. No. 481,644
Int. Cl.[2] E03B *7/10;* **F16L** *53/00*
U.S. Cl. 138—33 **3 Claims**



1. A plastic pipe which is fitted with an electrical conductor on an internal wall of the pipe that runs the length of the pipe, said conductor furnishing a path for a flow of electrical current to heat the contents of the pipe, said conductor being

electrically connected to electrical contact means adjacent to and inside each end of the pipe.

3,900,048

REINFORCED THERMOPLASTIC PIPE

Allan B. Isham, Newark, and Wilbur Shenk, III, Granville, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 164,376, July 20, 1971, abandoned. This application Feb. 14, 1974, Ser. No. 442,717

Int. Cl. F16l 9/12

U.S. Cl. 138—144 1 Claim

1. A pipe comprising an unreinforced tubular layer comprising a polyvinyl chloride tube placed under compression by criss-crossing filament-wound, impregnated strands of glass fibers, the impregnant of which comprises from 35 to 55 percent by volume of the impregnated strand of a thermoplastic, noncrosslinking material, said impregnant being selected from the group consisting of polyvinyl chloride, chlorinated polyvinyl chloride, acrylonitrile-butadiene-styrene terpolymer and mixtures of said acrylonitrile-butadiene-styrene terpolymer and vinyl resins, said impregnated strands being partially embedded in said layer of thermoplastic resin and being solvent-fused to each other and to said tubular layer to encapsulate and protect the fibers.

3,900,049

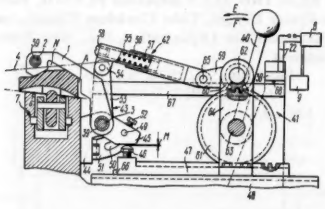
APPARATUS FOR GUIDING WEFT THREAD CARRIERS IN THE SHED OF A LOOM OF A PROGRESSIVE SHEDDING TYPE

Alexandr Alexandrovich Zabotin, ulitsa Profsojuznaya, 96, kv. 85; Eduard Arshakovich Onikov, ulitsa Panferova, 5 Korpus 2, kv. 106; Alexandr Lvovich Galperin, ulitsa Moldagulovoi, 10, korpus 3, kv. 166, all of Moscow; Evgeny Dmitrievich Loschilin, Kashirskoe shosse, 36, kv. 87, Moskovskoi oblasti; Valerian Petrovich Lileev, ulitsa Nagornaya, 46/48, korpus 20, kv. 2, Moscow; Roman Anatolievich German, ulitsa Davydkovskaya, 30, kv. 50, Moscow; Zinovy Yakovlevich Rutkevich, 8 kvartal, korpus 18, kv. 21, Moscow, and Boris Alexandrovich Sakharov, ulitsa Krzhizhanovskogo, 24/35, korpus 6, kv. 404, Moscow, all of U.S.S.R.

Filed May 16, 1973, Ser. No. 360,944

Int. Cl. D03d 47/26

U.S. Cl. 139—12 3 Claims



1. Apparatus for guiding weft thread carriers in the shed of a loom of a progressive shedding type, including a drive and a control circuit of the drive, the apparatus comprising plates embracing said weft thread carrier for guiding it in said shed; bars on which said plates are mounted in spaced relationship for the passage of warp threads therebetween, said plates being electrically connected to said control circuit of said drive, said weft thread carrier being adapted upon having encountered an obstacle in said shed to cooperate with said plates to break said electric control circuit of said drive and thus to de-energize said drive, said electric control circuit of said drive including one of said plate-supporting bars and at least every other said plate, said plates being mounted on said bars by means of insulating bushings, said weft thread carrier having movable electric contacts adapted to protrude therefrom upon said weft thread carrier having encountered an obstacle in said shed and to engage said plates, whereby said electric control circuit of said drive is broken.

3,900,050

REED DENT ARRANGEMENT

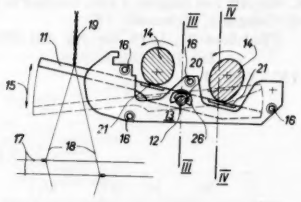
Edgar Strauss, Ruti, Zurich, Switzerland, assignor to Ruti Machinery Works Ltd., Ruti, Zurich, Switzerland

Filed Jan. 28, 1974, Ser. No. 436,866

Claims priority, application Switzerland, Feb. 2, 1973, 1540/73

Int. Cl.² D03D 47/26

U.S. Cl. 139—12 8 Claims



1. A reed dent arrangement for a wave-motion loom wherein the reed dents are arranged between laminar guide elements, are of elongate lamella-like shape, and travel at one narrow side on a drive camming means due to which there are imparted to them a rocking movement which takes place about a pivot extending perpendicular to their broad sides, characterized in that each reed dent has at least at one location a thickened portion which bears on said drive camming means and said pivot, and in those zones over which the thickened portions extend and over which they travel, the guide elements are formed with recesses.

3,900,051

APPARATUS AND METHOD FOR SUPPLYING PILE WARP THREADS IN A LOOM FOR WEAVING TERRY CLOTH

Robert Bucher, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 2, 1974, Ser. No. 457,267

Claims priority, application Switzerland, Apr. 6, 1973, 4914/73

Int. Cl.² D03D 39/22, 49/12

U.S. Cl. 139—25 14 Claims

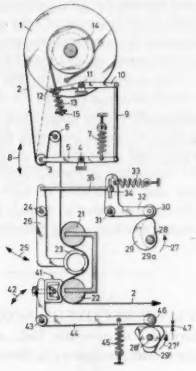
1. An apparatus for supplying pile warp threads in a loom for weaving terry cloth comprising

a pile warp release means for delivering pile warp threads at a constant tension to a shed;

a storage means downstream of said pile warp release means for forming a reserve of pile warp thread upstream of the shed between successive full beat-ups of the loom; and

a clamping means between said storage means and the shed

for selectively releasing the reserve of pile warp thread from said storage means during a full beat-up to supply a



measured length of pile warp thread in a substantially untensioned state.

3,900,052

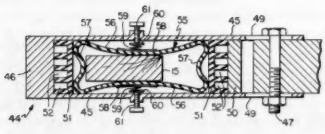
LUG STRAP FOR WEAVING LOOM

Charles E. Benedict, Tallahassee, and Calvin C. Oliver, Gainesville, both of Fla., assignors to Wayne H. Coloney Company, Inc. and Controlled Acoustics, Inc., both of Tallahassee, Fla.

Filed Jan. 15, 1974, Ser. No. 433,592

Int. Cl.[2] D03D *49/40*

U.S. Cl. 139—153 **6 Claims**



1. Apparatus for driving and controlling the picker sticks of a fly-shuttle weaving loom comprising a generally U-shaped lug strap having a pair of generally parallel arms connected by a bight portion, at least one bumper mounted on said lug strap, a friction applying member carried by said lug strap, said member having a pair of opposed side walls and at least one end wall, each of said side walls having first portions engaging the arms of said lug strap and a second portion extending inwardly to frictionally engage the picker stick, said end wall having first portions engageable with said bumper and a second portion spaced therefrom in a position to engage and cushion said picker stick when the stick is moved against the same, and means for moving said lug strap.

3,900,053

DEVICE FOR CUTTING BENDING AND CORRUGATING THE LEADS OF ELECTRIC COMPONENTS

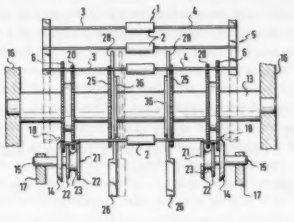
Thomas Weresch, Augartenstrabe 86, D-7500 Karlsruhe, Germany

Filed Nov. 2, 1973, Ser. No. 411,929

Claims priority, application Germany, Nov. 2, 1972, 2256290

Int. Cl. B21f *45/00*

U.S. Cl. 140—105 **51 Claims**



1. A device for cutting and bending the leads of electrical components, comprising transport sprocket wheels disposed on a shaft, and shearing tools disposed immediately adjacent the same on the device housing, characterized in that two bending sprocket wheels acting as coacting holders are disposed between the transport sprocket wheels, a bending tool disposed on the housing being associated with each such bending sprocket wheel and laterally thereof, said bending sprocket wheels being slidable in the axial direction together with the bending tools until they abut one another, and characterized in that adjacent each bending sprocket wheel and opposite the associated bending tool there is disposed a tension relief means which is mounted resiliently on the housing and which cooperates with the bending tool.

3,900,054

AUTOMATIC ICING MACHINE FOR CAKES

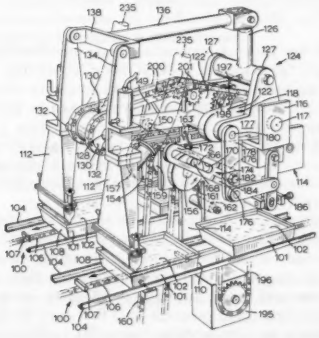
Brian Hamer, Brampton, and David G. Doman, Mississauga, both of Canada, assignors to Kitchens of Sara Lee (Canada) Ltd., Bramalea, Canada

Filed Feb. 7, 1974, Ser. No. 440,342

Claims priority, application United Kingdom, Feb. 14, 1973, 7311/73

Int. Cl.[2] B65B *3/04*

U.S. Cl. 141—1 **14 Claims**



1. Apparatus for sequentially dispensing material into a plurality of containers, comprising:

conveying means for conveying said containers sequentially in a first direction such that each container has a leading edge and a trailing edge,

nozzle means above the containers for delivering material to each container sequentially,

means for inserting the nozzle means into each container rearwardly adjacent the leading edge thereof, for holding said nozzle means in the container as the latter passes under the nozzle means in said first direction, and for with-drawing the nozzle means out of the container when the container has advanced so as to bring the nozzle means to a position forwardly adjacent the trailing edge thereof, said means for inserting the nozzle means including a rotatable member having an axis of rotation and a pivot point eccentric of said axis, means for intermittently and repeatedly rotating said rotatable member a full turn about said axis, and linking means for transferring the motion of said pivot point to the nozzle means such that the nozzle means undergoes loop movement which is at least a facsimile of the movement of the pivot point, said loop movement including initial motion at a first level in the direction of container movement, intermediate motion at a higher level in the opposite direction from that of container movement, and final motion at said first level in the direction of container movement, said loop movement of the nozzle means resulting in the withdrawal of the nozzle means from one container and the insertion of the nozzle means into the next subsequent container,

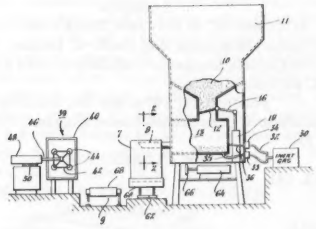
and control means for initiating the dispensing of material from the nozzle means upon insertion and for terminating said dispensing upon withdrawal.

3,900,055

BAG PACKING APPARATUS

Allan L. Henry, New Eagle, Pa., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 16, 1974, Ser. No. 433,638
Int. Cl. B65b *1/04*
U.S. Cl. 141—67 **6 Claims**



1. A bag packing apparatus having an operating cycle including a fill mode and a dwell mode comprising:

storage means for receiving and containing a powdered or finely granulated material which is to be packed into a bag;

an elongated spout communicating with said storage means;

means for conveying material from said storage means to said spout and for causing the material to flow from said spout;

a first material flow control means for cyclically enabling the discharge of material from said spout into a bag positioned on said spout during a fill mode interval of said operating cycle and for disabling the flow of material from said spout during a dwell mode interval of said operating cycle; wherein said first material flow control means includes a value means for enabling or disabling the flow of material from said spout actuating means for activating said valve between flow enabling and flow disabling positions, a pneumatic bistable fill cycle control valve having first and second outlet lines, and means coupled to said fill cycle control valve and said actuating means for causing the activation of said material flow control valve to a closed position when said fill cycle valve is in a first state and to an open position when said fill cycle valve is in a second state;

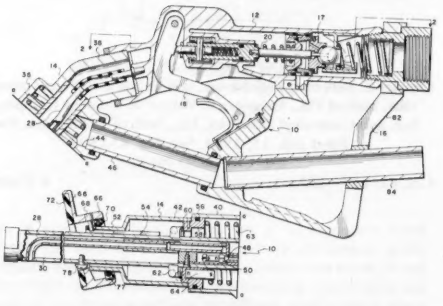
means for supplying and positioning an empty bag about said spout and for discharging a filled bag from said spout during a dwell mode interval of said operating cycle; and a second material flow control means including a switch, said switch positioned at said spout for engagement by a bag when a bag is positioned on the spout, said second material control means arranged for disabling the flow of material during a fill mode interval of said operating cycle when a bag on said spout becomes disengaged from said switch wherein said second flow control means includes a pneumatic signalling element coupled to said fill cycle control valve and responsive to said switch for causing said fill cycle control valve to switch from said second to said first condition when a bag becomes disengaged from said switch.

3,900,056

VAPOR RECOVERY NOZZLE

Virgil Victor Giardini, Connersville, Ind., and Richard Gordon Bisker, Salisbury, Md., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 23, 1974, Ser. No. 508,581
Int. Cl. B65b *1/28*
U.S. Cl. 141—93 **8 Claims**



1. An improved gasoline dispensing nozzle of the automatic shut-off type for use in connection with vapor recovery systems including a body containing a flow control valve, induction means for causing gas flow through a nozzle, a trigger for activating the flow control valve and pressure responsive latch means operable in conjunction with the induction means to release the flow control valve regardless of the trigger position, the improvement comprising:

an elongate hollow spout;

a conduit extending substantially through the interior of said spout for connection with the induction means and including valve means for opening and closing said conduit;

a hollow member for connecting said spout in fluid communication with the body and having an enlarged portion forming a portion of a vapor passageway with said spout and a port therethrough providing fluid communication between said vapor passageway and vapor recovery system;

a hollow piston loosely encircling said spout and forming a portion of said vapor passageway therewith, said piston having a first end portion slidingly and sealingly received in said hollow member and having a second end portion;

an articulated seal assembly located on and movable with the second end of said piston in sealing relationship therewith and loosely encircling said spout, said assembly

forming another portion of the vapor passageway having a seal member thereon arranged to sealingly engage a projecting surface on a tank to be filled whereby said vapor passageway provides communication between the tank and vapor recovery system; and,

valve operating means carried by said piston for operating said valve means to open said conduit when said piston is moved into said hollow member permitting operation of said nozzle and operating said valve means to close said conduit preventing operation of said nozzle.

3,900,057

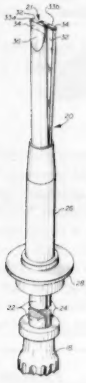
EXPANDABLE BIT SCREW HOLDING SCREWDRIVER

Earl Benitz, P.O. Box 106, Petersburg, Alaska 99833

Filed Apr. 23, 1974, Ser. No. 463,208

Int. Cl. B25b *15/02*

U.S. Cl. 145—50 E **2 Claims**



1. An expandable bit screw-holding screwdriver comprising:

a. a handle;

b. an elongated split shank having one end affixed to said handle, said elongated split shank comprising two identical elongated sections, one lying on either side of the longitudinal axis defined by said elongated split shank, each of said sections including:

1. a flat contact face extending substantially the entire length of said section and being substantially equal in width to the width of said section, said flat contact faces of said sections lying in overlapping contacting engagement with one another along substantially their entire length, the amount of said overlap decreasing with distance at least near the end of said elongated split shank remote from the end thereof affixed to said handle;

2. an overlapping driving tip formed in the end of said section remote from the end of said elongated split shank affixed to said handle, the overlapping driving tips of both of said sections cooperating to form an expandable screwdriver bit, each of said overlapping driving tips being wedge-shaped over their entire width when viewed in a plane orthogonal to the longitudinal axis of said elongated split shank, one surface of said wedge-shape being defined by the flat contact face of said section, the other surface of said wedge-shape defining a bit face, said bit face diverging inwardly with respect to said flat contact face when viewed in said plane orthogonal to said longitudinal axis of said elongated split shank, said bit face also tapering inwardly toward said handle and said longitudinal axis; and,

3. an outer-tip-divergence-control surface extending substantially the entire distance between said handle and said overlapping driving tip; and,

c. a sleeve slidably mounted on said elongated shank about said outer-tip-divergence-control surfaces of said sections, said sleeve including an aperture shaped similar to the shape of said outer-tip-divergence-control surfaces and equal in size to the size of said outer-tip-divergence-control surfaces when said sections fully overlap one another, whereby movement of said sleeve toward said overlapping driving tips of said sections increases the amount of section overlap in the region of said overlapping driving tips, the increase in overlap moving said bit faces away from one another, said sleeve being slidably movable between an unexpanded driving tip divergence position whereat the sleeve is near said handle and an expanded driving tip divergence position whereat the sleeve is near said overlapping driving tips of said sections.

3,900,058

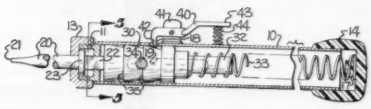
MULTIPURPOSE IMPACT HAND TOOL

Meade McArdle, Rt. 2, Box 73A, Horse Shoe, N.C. 28742

Filed Sept. 12, 1974, Ser. No. 505,468

Int. Cl.[2] B25B *19/00*

U.S. Cl. 145—50 R **10 Claims**



8. An impact hand tool particularly adapted for driving a threaded fastener and for applying an impact thereto when needed to facilitate starting the fastener or to overcome binding thereof, said hand tool comprising an elongate, tubular body portion having an elongate slot opening through the side wall thereof extending longitudinally along a portion of the length of the body portion, an elongate bit extending axially from one end of the body portion and being mounted for axial sliding movement relative thereto, said bit having means at the inner end thereof cooperating with the body portion to prevent rotative movement of the bit relative to the body portion, an impact hammer mounted for axial sliding movement within the tubular body portion toward and away from the bit, a compression spring cooperating with the impact hammer and with the body portion for biasing the impact hammer toward the bit, finger-engageable means carried by the impact hammer and extending through the elongate slot opening in the body portion and being adapted to facilitate moving the impact hammer longitudinally away from the bit against the biasing force of the spring means and to a cocked position whereby upon subsequent release of the finger-engageable means, the impact hammer is thrust by the compression spring toward the bit to force the bit outwardly from the body portion for imparting an impact to the fastener.

3,900,059

MOUNTING DEVICE

Lawrence J. Kirk, New Shrewsbury, N.J., and Marshall G. Baldwin, Westport, Conn., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Sept. 10, 1973, Ser. No. 395,421

Int. Cl. A47f *5/00;* **B65d** *31/00*

U.S. Cl. 150—1 **7 Claims**

1. A mounting device for supporting a package including a stiffener card comprising,

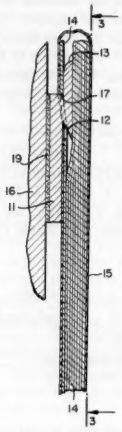
a. a base portion having an outer planar surface and a first inner planar surface generally parallel to said outer planar surface,

b. a hook portion adjacent to and integral with said base portion,

c. said hook portion having a second inner planar surface generally parallel to and spaced from said outer planar surface and said first inner planar surface,

d. said outer and second inner planar surfaces being partially coextensive, said outer planar surface extending below said second inner planar surface, and said second inner planar surface extending above said outer planar surface,

e. an undercut surface extending from said first inner planar surface to said second inner planar surface,



f. said undercut surface forming an acute angle with said first inner planar surface,

g. a connecting shoulder surface extending from said outer planar surface to said second inner planar surface,

h. adhesive means disposed on said outer planar surface and adapted to adhere said base portion to a fixed surface,

i. said hook portion being adapted to engage a stiffener card through a die cut slot in said card.

3,900,060

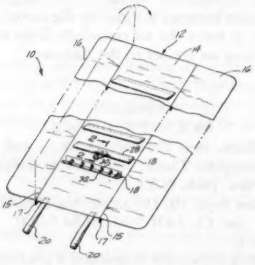
JEWELRY BAG

Antoine Shammas, 66 Trinity Pl., New York, N.Y.

Filed June 12, 1973, Ser. No. 369,310

Int. Cl.[2] B65D *85/02*

U.S. Cl. 150—52 R **18 Claims**



16. A device for supporting and storing jewelry comprising a first relatively flat mounting sheet, at least one pair of operatively associated jewelry support flaps secured to said mounting sheet, and securing means mounted on said flaps for securing individual pieces of jewelry between said pair of flaps; said securing means comprising cooperating male and female snap members respectively mounted on the opposite flaps of said pair of cooperating flaps.

3,900,061

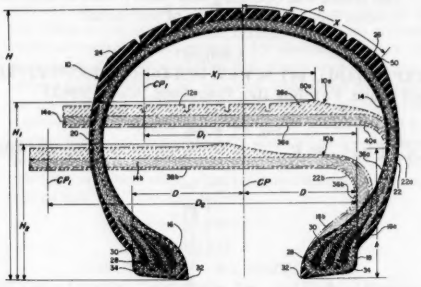
METHOD OF FABRICATING LARGE TIRES

Walter W. Curtiss, Jr., Brimfield, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 12, 1973, Ser. No. 323,166

Int. Cl.[2] B60C *5/00*

U.S. Cl. 152—352 **10 Claims**



6. A pneumatic tire having a tread portion, a pair of sidewall portions, a pair of bead portions, a carcass extending from bead portion to bead portion, and an outside inflated unloaded diameter greater than 200 inches, said tire when in the configuration in which it is in, when it is in the curing mold, having a section height which is equal to between 50 and 80 percent of the inflated unloaded section height and having a cross-sectional contour length between the beads which is at least 2 percent greater than the cross-sectional contour length of the tire when inflated and unloaded.

3,900,062

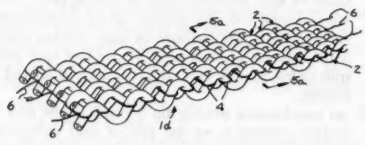
ZERO DEGREE BELTED TIRES BUILT WITH HIGH SOFT STRETCH BELT-FORMING TAPES

James J. Neville, Kinnelon; Wesley Ferrell, Wayne, and Daniel Shichman, Cedar Grove, all of N.J., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 160,675, July 8, 1971. This application May 10, 1973, Ser. No. 359,118

Int. Cl. B60c *9/16*

U.S. Cl. 152—361 FP **69 Claims**



1. A 0° belted tire, comprising:

A. a toroidal carcass;

B. a rubber tread extending from one shoulder of the tire to the other in surrounding relation to the crown region of said carcass; and

C. a 0° belt disposed beneath said tread and circumferentially of said carcass;

D. said belt being constituted of

1. a plurality of reinforcing cords
2. extending as a unit in a substantially straight condition helically circumferentially of said carcass
3. for at least a plurality of full turns
4. at an angle of substantially 0° to the mid-circumferential plane of said carcass,

5. at least two of said plurality of said cords in each turn thereof in said belt being disposed in side by side relation to one another widthwise of said belt and thereby being arranged in a multiple lead screw thread-like formation over the width of said belt, and

E. each of said cords being locally weakened at a multiplicity of longitudinally spaced portions thereof,

1. said weakened portions of each cord being out of lateral alignment with the weakened portions of at least each next adjacent cord, and

2. the extent of weakening of each cord being sufficient to reduce the tensile strength thereof at each of said weakened portions to between about 5 percent and about 20 percent of its full tensile strength.

3,900,063

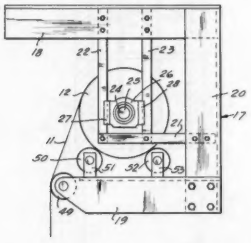
ROLLER CURTAIN

Max F. Roller, Lincolnwood, Ill., assignor to J. H. Channon, Inc., Chicago, Ill.

Filed June 18, 1973, Ser. No. 370,960

Int. Cl.[2] E06B *9/08*

U.S. Cl. 160—310 **6 Claims**



1. Apparatus forming a roll up partition which extends from an overhead support and a floor or the like, comprising:

a pair of spaced apart rotary bearing means for attachment to the overhead support and mounted for vertical movement;

a cylindrical roller having opposite ends journalled for rotation in respective ones of said bearing means;

a curtain for winding about said cylindrical roller and having one end attached to said cylindrical roller and a second end depending therefrom;

means extending the length of and supporting said roller and said curtain; and

drive means connected to said cylindrical roller for rotating said roller wind and unwind said curtain, said bearing means moving vertically in unison together as the moving curtain winds on or off of said cylindrical roller, said means supporting said cylindrical roller comprising an endless web which passes beneath and supports said roller, said web having a width substantially equal to the length of said roller and with the web having a substantial arcuate area engaging the bottom side of the roller.

3,900,064

METAL CASTING

George D. Chandley, and John N. Lamb, both of Amherst, N.H., assignors to Hitchiner Manufacturing Co., Inc., Milford, N.H.

Division of Ser. No. 312,138, Dec. 4, 1972, Pat. No. 3,863,706.

This application Feb. 1, 1974, Ser. No. 438,692

Int. Cl. B22d *27/02*

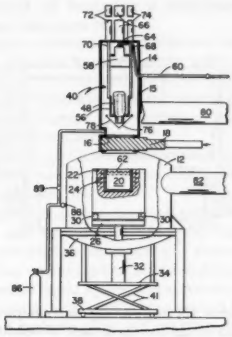
U.S. Cl. 164—51 **1 Claim**

1. A method of casting in a refractory, gas permeable, shell mold comprising the steps of

providing a mold having a lower open end with a central vertical riser passage having a plurality of mold cavities clustered thereabout connected to said riser passage by gate passages, the cross section area dimension of said riser passage is at least five times as great as the cross section area dimension of a gate passage,

providing a crucible having surrounding induction coils for holding molten metal,

stirring said molten metal by means of said coils causing outward surface movement thereof along its surface to



carry impurities away from the central area of said crucible,

lowering the lower open end of said mold beneath the surface of the central area of said crucible,

causing molten metal to fill said riser passage and said mold cavities through said gate passages and

draining molten metal from said riser passage after solidification thereof in said mold cavities.

3,900,065

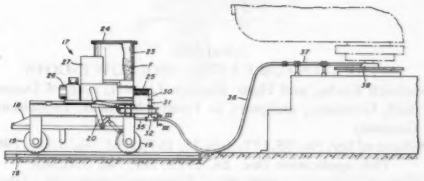
FLUX FEEDING METHOD AND APPARATUS

Joseph S. Giunta, Monroeville, and Louis G. Lazzaretti, Ambridge, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed May 17, 1973, Ser. No. 361,363

Int. Cl. B22d *11/00*

U.S. Cl. 164—273 R **6 Claims**



1. The combination, with a plurality of continuous-casting molds and a casting floor adjacent said molds, of an apparatus for feeding powdered flux to said molds, said apparatus including a corresponding plurality of bins for enclosing supplies of flux, a corresponding plurality of feeding devices for receiving flux from said bins, means for delivering flux from said feeding devices to the respective molds, and means for introducing gas to said flux-delivering means, the improvements in which:

said apparatus comprises a portable carriage on which said bins and said feeding devices are mounted;

said gas-introducing means comprises a header mounted on said carriage, respective branches connecting said header with said flux-delivering means, and respective sub-branches connecting said branches with said bins, said bins being gas-tight; and

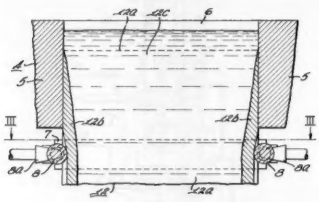
said flux-delivering means includes in part a flexible tube.

3,900,066

APPARATUS FOR CONTINUOUS CASTING A METAL STRAND SHAPED TO PROVIDE CONCAVE SURFACES

Rudolf Schoffmann, Linz, Austria, assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jan. 2, 1974, Ser. No. 429,701
Int. Cl.[2] B22D *11/12*
U.S. Cl. 164—282 **2 Claims**



1. An apparatus for supporting and shaping a strand of continuously cast metal having a shell of solidified metal and a still liquid core of molten metal, said apparatus comprising:

a. a plurality of strand supporting rolls arranged to define a multi-sided strand passageway with at least a first pair of said rolls being of uniform diameter along its entire length, parallel and spaced apart in mutually facing arrangement and a second pair of said rolls parallel to each other and arranged between the rolls of said first pair;

b. each roll of said second pair having an axial length less than the distance between the rolls of the first pair of rolls and each roll of said second pair is arranged with its axial ends spaced from the close adjacent roll of the first pair; and

c. each roll of said second pair having equal end diameters smaller than a diameter midway between said end diameters and defining a convex peripheral surface, for supporting between said pair of rolls a continuous strand of continuously cast metal having a shell of solidified metal and a still liquid core and shaping the strand to form a pair of oppositely facing strand surfaces to define a continuous concave arch.

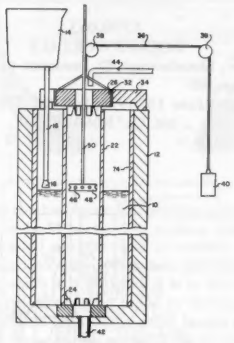
3,900,067

APPARATUS FOR CASTING HOLLOW INGOTS

Friedrich Kocks, and Hans Joachim Lippert, both of Dusseldorf, Germany, assignors to Friedrich Kocks, Dusseldorf, Germany

Division of Ser. No. 55,177, July 15, 1970, Pat. No. 3,735,798. This application Dec. 26, 1972, Ser. No. 318,582
Claims priority, application Germany, Aug. 30, 1969, 1944149
Int. Cl.[2] B22D *19/00, 17/24*
U.S. Cl. 164—332 **9 Claims**

1. An apparatus for the production of hollow casting comprising a mold adapted to receive molten metal, an axial tube of metal compatible with a metal to be poured in said mold fixed axially of said mold, said tube having an inside diameter substantially equal to the inside diameter of a hollow casting to be produced and means for delivering molten metal into the area between the mold and axial tube, vertically movable cooling means arranged in the center of the ingot mold having a diameter smaller than the inside diameter of the inserted tube and means for moving said cooling means vertically at a speed related to pouring speed, whereby the cooling means follows the level of molten metal entering the mold to solidify the molten metal in contact with the said axial tube while permitting the temperature of the axial tube and metal to rise below the cooling means and wherein the cooling device is a circular plate arranged at a right angle to the ingot mould axis, and movable in the axial direction of the ingot mould and that above the upper end of the inserted tube an inlet for cooling liquid into the axial tube is provided.



3,900,068

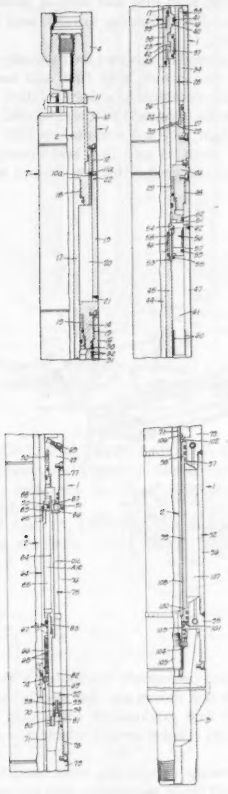
STROKE TYPE DRILL STEM TESTER

Lyle B. Scott, South Gate, Calif., assignor to Byron Jackson, Inc., Long Beach, Calif.

Filed Mar. 11, 1974, Ser. No. 449,879
Int. Cl.[2] E21B *47/00, 49/00*
U.S. Cl. 166—152 **6 Claims**

6. A formation tester for use in testing an earth formation penetrated by a well bore and adapted to be lowered into the well bore on a pipe string above a well bore packer which is set in the well bore by the weight of the pipe string comprising: telescopic elongated inner and outer bodies respectively having at one end means for connection with said pipe string and with said packer, said bodies defining a flow passage therethrough, and valve means including relatively longitudinally shiftable valve members carried by said bodies normally closing said flow passage when said bodies are telescopically extended and opening said flow passage when said bodies are telescopically contracted, and formation fluid balancing means between said bodies responsive to formation fluid pressure on said valve members when in said closed position for imposing a force tending to telescopically contract said bodies and to move said valve members to said open position, wherein said balancing means comprises outer and inner bodies, respectively, an intermediate cylinder, a piston carried by said inner cylinder and slideably engaged with said intermediate cylinder to define a chamber, said chamber containing

air, said intermediate cylinder and said outer cylinder defining an annular space, an annular free piston in said annular space,



said annular space being filled with oil, and means exposing said annular piston to the pressure of said formation fluid.

3,900,069

RECOVERY OF PETROLEUM BY FLOODING WITH VISCOUS AQUEOUS SOLUTIONS OF ACRYLAMIDE-DIACETONE ACRYLAMIDE COPOLYMERS

Amir M. Sarem, Yorba Linda, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed July 11, 1974, Ser. No. 487,611
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—274 **9 Claims**

1. In a process for recovering petroleum from a subterranean oil-bearing formation in which a viscous flooding medium is injected through an input well penetrating said formation and forced through said formation towards at least one spaced output well and petroleum is recovered from said output well, the improvement which comprises employing as said flooding medium an aqueous solution of an acrylamidediacetone acrylamide copolymer.

3,900,070

GELLING LIQUID HYDROCARBONS

Jiten Chatterji; Marlin D. Holtmyer, and Robert L. Tiner, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed May 6, 1974, Ser. No. 467,312
Int. Cl.[2] E21B *43/26*
U.S. Cl. 166—308 **10 Claims**

1. The method of fracturing a subterranean formation which comprises the steps of:

a. contacting the subterranean formation with a liquid at a sufficient pressure to fracture the subterranean formation;

b. injecting the liquid into said fracture at a sufficient rate to open said fracture to a sufficient width to accept a gelled liquid hydrocarbon;

c. injecting said gelled liquid hydrocarbon into said fracture at a sufficient rate to extend said fracture into the subterranean formation; and

d. reducing the rate of injecting said gelled liquid hydrocarbon into said fracture to below the rate required for holding said fracture open, thereby permitting said fracture to close on said gelled liquid hydrocarbon;

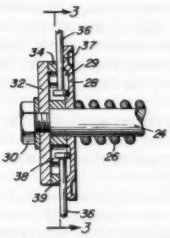
wherein said gelled liquid hydrocarbon comprises a mixture of oil soluble aliphatic carboxylic acids selected from those having about 5 to 8 carbon atoms and mixtures thereof, a gelling quantity of an aluminum salt of 2-methyl pentanoic acid, and a liquid hydrocarbon.

3,900,071

PLATE TYPE NAIL HOLDER FOR EDGERS, TRIMMERS, OR OTHER APPLICATIONS

Howard H. Crawford, 9801 Carnegie, El Paso, Tex. 79925

Filed Apr. 10, 1974, Ser. No. 459,904
Int. Cl. A01d *35/00;* **B26d** *1/12*
U.S. Cl. 172—15 **7 Claims**

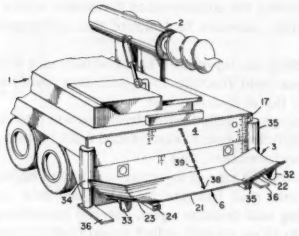


1. A rotary cutting head for a lawn edger having a drive shaft comprising a driven plate stationarily mounted on the shaft, a pressure plate mounted on said shaft and movable axially thereon toward and away from the driven plate, means biasing the pressure plate toward the driven plate, a cutter element retaining plate journaled on said shaft and disposed between the driven plate and pressure plate, a plurality of radially extending cutter elements carried by said retaining plate, said retaining plate including mounting means for the cutter elements, each of said cutter elements having a headed inner end and a shank, said mounting means including radially extending recess means in the retaining plate for receiving the headed inner end and adjacent portion of the shank of the cutter element whereby the pressure plate will retain the cutter elements mounted on the retaining plate and bias the driven plate, retaining plate and pressure plate toward each other for frictionally driving the retaining plate and pressure plate from the driven plate and enabling slippage of the driven plate in the event the cutter elements engage an obstruction.

3,900,072
ADJUSTABLE BLADE AND CARRYING MEANS

Albert E. Knight, P.O. Box 1774, 11301 Willow Dr., Fort St. John, British Columbia, Canada

Claims priority, application Canada, Nov. 27, 1972, 157530
Filed Nov. 26, 1973, Ser. No. 419,096
Int. Cl. A01b 65/00
U.S. Cl. 172—238 10 Claims



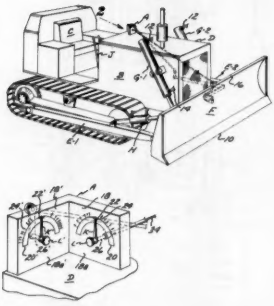
1. An attachment for the rear of the frame of a drilling truck for levelling drilling chips, comprising:
a substructure to be mounted on the truck frame;
a plurality of blade hangers fixedly attached to the substructure;
vertically adjustable blade control means, to be mounted on the truck frame;
a blade;
a plurality of blade supports fixedly attached to the blade;
means securing the respective blade supports to the respective blade hangers with provision for vertical movement of the blade with respect to the substructure and for pivotal movement of the blade between a vertical disposition in which the blade faces rearwardly for use and horizontal disposition for storage;
a blade elevation control support positioned to be engaged with the blade control means when the blade is vertically disposed so that when the blade control means is vertically adjusted when engaged with the blade elevational control support, the blade is correspondingly raised or lowered;
a blade retaining means secured on the blade;
and a blade retainer connectable the blade to retain the blade in the horizontal disposition thereof with respect to the substructure.

3,900,073
EARTH WORKING DEVICE WITH PREDETERMINED GRADE INDICATING ASSEMBLY

William Norman Crum, 3511 E. 20th St., Highland, Calif. 92346

Filed Oct. 15, 1974, Ser. No. 514,462
Int. Cl.[2] A01B 15/10; G01C 9/24
U.S. Cl. 172—430 7 Claims

1. In combination with an earth working device of the type that includes a power movable vehicle having a support for an operator; an earth working blade movably supported from said vehicle that may be angulary tilted both transversely and longitudinally relative thereto, said blade having a lower edge; manually operated control means adjacent said support that may be manipulated by said operator to guide said vehicle and tilt said blade; an assembly for visually indicating to said operator when said vehicle is moving said blade to form a swath in the earth of a predetermined grade both transversely and longitudinally; said assembly including:
a. first and second flat members rigidly mounted on said vehicle adjacent said support, said members having first and second grade indicating graduations thereon;
b. first and second bubble tubes mounted on said first and second members adjacent said first and second graduations, with first and second bubbles in said first and second tubes occupying first positions when said blade has said lower edge thereof horizontally disposed;
c. first and second shafts rotatably supported in said first and second members and normal thereto;
d. first and second needles adjustably and pivotally supported from said first and second shafts, said first and second needles extending towards said first and second graduations;
e. first and second means that are manually operable by said operator for locking said first and second needles in desired non-rotatable positions relative to said first and second shafts, with said first and second needles being so locked when they are oriented on said first and second shafts to point to said first and second graduations to predetermined grades that are desired to be formed;



f. third means operatively associated with said first needle and blade that moves said first needle relative to said first tube and first graduations when said blade is pivoted transversely relative to said vehicle to a second transverse position;
g. fourth means operatively associated with said second needle and blade that moves said second needle relative to said second tube and second graduations when said blade is pivoted longitudinally relative to said vehicle to second longitudinal position, with said operator being visually informed as said vehicle moves over said swath that the latter has been formed to said predetermined grades when said first and second bubbles are centered on said first and second needles that have been locked in said predetermined grade indicating positions.

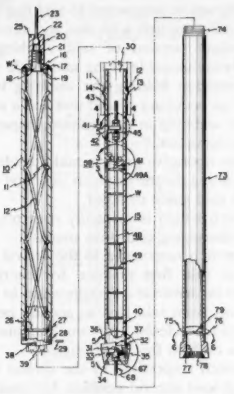
3,900,074
SAND REMOVAL TOOL FOR WELLS

George W. Lee, Rangely, Colo. 81648

Filed Apr. 19, 1974, Ser. No. 462,509
Int. Cl.[2] E21B 27/00, 37/00
U.S. Cl. 175—242 13 Claims

1. A vertically suspendable, longitudinally reciprocable tool for removing sand at the bottom of a well, said tool comprising telescoping outer and inner tube members, said tube members having inter-cooperating means helically keying said tube members together whereby the longitudinal reciprocation of said outer tube member will produce a revolvement of said inner tube member; a sand tube extension integral with and axially depending from said inner tube member and having a lower extremity; and a hollow bit member fastened to said sand tube extension at said lower extremity, said inner tube

member, sand tube extension, and hollow bit member forming a combination, said combination and said outer tube member



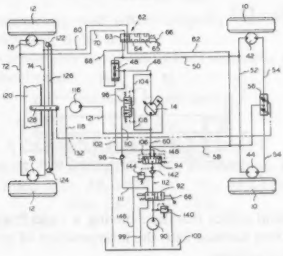
each having mutually inter-cooperating, impact abutment means for circumferentially advancing said bit member.

3,900,075

HYDROSTATIC PROPULSION SYSTEM

Willard L. Chichester, and Donald A. Holtkamp, both of Battle Creek, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Apr. 15, 1974, Ser. No. 460,832
Int. Cl. B60k *17/10;* **B62d** *11/04*
U.S. Cl. 180—6.3 **29 Claims**



1. In a hydrostatic power transmission system for vehicles having first and second longitudinally spaced selectively drivable wheel means and first and second hydraulic motor means for driving said wheel means, a fluid drive means which includes a closed loop drive circuit coordinated with an open loop drive circuit, said drive circuits including first and second drive pump means, and control means for driving said first and second hydraulic motor means by said closed loop drive circuit and alternatively for driving said first hydraulic motor means by combining said closed and open loop drive circuits.

3,900,076

ROUGH TERRAIN VEHICLE UTILIZING GYROSCOPIC FORCES (INCHWORM)

Richard C. Winfrey, 1039 Cove, Ventura, Calif. 93003

Filed Nov. 16, 1973, Ser. No. 416,704
Int. Cl.² B62D *57/02*
U.S. Cl. 180—8 E **27 Claims**

1. A rough terrain vehicle utilizing gyroscopic forces comprising:

a. a platform having a front end and a rear end;

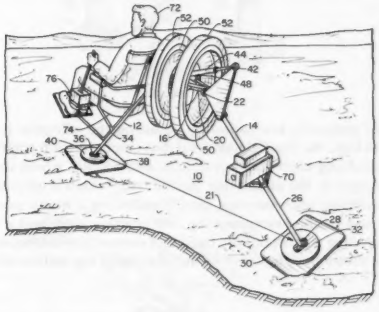
b. a front support member pivotally connected to said front end of said platform;

c. a rear support member pivotally connected to said rear end of said platform; said front support member, said platform, and said rear support member being physically disposed in a common plane;

d. means for imparting controlled pivotal movement in said common plane to said front support member with respect to said front end of said platform, said means being connected between said front support member and said platform;

e. means for imparting controlled pivotal movement in said common plane to said rear support member with respect to said rear end of said platform, said means being connected between said rear support member and said platform; and

f. means for imparting controlled gyroscopic forces to said platform such that said platform controllably rotates about an axis perpendicular to said common plane and



about a vertical axis, said means being attached to said platform, said means for imparting controlled gyroscopic forces operates synchronously with said means for imparting controlled pivotal movement to said front support member and said means for imparting controlled pivotal movement to said rear support member such that said front support member is lifted into the air by said means for imparting controlled gyroscopic forces to said platform while said front support member is extended forward by said means for imparting controlled movement to said front support member then said front support member is lowered to the terrain by said means for imparting controlled gyroscopic forces to said platform and then said rear support member is lifted into the air by said means for imparting controlled gyroscopic forces to said platform while said rear support member is extended forward by said means for imparting controlled movement to said rear support member then said rear support member is lowered to the terrain by said means for imparting controlled gyroscopic forces to said platform whereby said vehicle traverses said rough terrain.

3,900,077

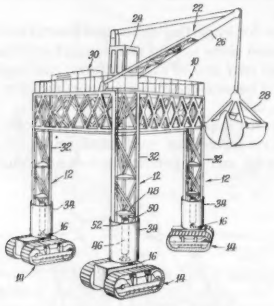
VEHICLE FOR SURF ZONE WORK

James E. Gee, Washington, and Harlan H. Fels, Chillicothe, both of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

Filed Apr. 3, 1974, Ser. No. 457,493
Int. Cl.² B62D *11/20*
U.S. Cl. 180—9.46 **6 Claims**

1. A vehicle for surf zone work comprising: a generally horizontal platform adapted to be located above water level and support work equipment; a plurality of at least three legs extending downwardly at spaced locations, from said platform; a plurality of at least three traction units, one for each leg, for engaging and traveling upon submerged terrain; a

plurality of means, one for each leg, connecting an associated traction unit to the lower end of a corresponding leg for substantially universal movement thereon; a plurality of steering devices, one for each leg, for selectively rotating the associated traction unit about a generally vertical axis; a plurality of means, one for each leg, for selectively adjusting the effective length of the associated leg; whereby said vehicle may travel over uneven, submerged terrain with said platform maintain-



able generally horizontal by adjusting the effective length of said legs, the limited universal movement of each traction unit permitting each traction unit to individually adjust to abrupt changes in the underlying terrain over which it individually is travelling; each steering device including a motor connected to one of the associated leg and traction unit; and a linkage including a substantially universal connection interconnecting the motor and the other of the associated leg and traction unit.

3,900,078

SAFETY HARNESS ARRANGEMENT

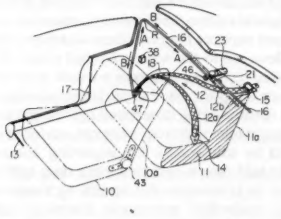
Syuichi Otani, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Mar. 21, 1973, Ser. No. 343,260

Claims priority, application Japan, Mar. 22, 1972, 47-33716

Int. Cl. B60r *21/10*

U.S. Cl. 180—82 R **10 Claims**



1. A safety harness arrangement for use in a motor vehicle, comprising,

a webbing anchored at one end to a lower stationary member located at a relatively low part of a vehicle cabin adjacent a seat and at the other to an upper stationary member located at a relatively upper part of the vehicle cabin,

an elongated hollow guide member having a longitudinally extending slot formed in the peripheral wall thereof, said guide member having one end located at another relatively low part of the vehicle cabin adjacent said seat and spaced apart substantially transversely of the seat from said lower stationary member across and over said seat and which extends partly generally vertically on an inner surface of a side structual member of a vehicle body and partly substantially horizontally over said seat,

an elongated flexible member accommodated in said guide member and being longitudinally movable along said guide member,

retaining means so connected to said flexible member as to be movable through said slot and retaining thereon an intermediate portion of said webbing, said retaining means being movable along said guide member between a first position holding the webbing in a condition to restrain an occupant of said seat and a second position to hold the webbing in a condition inoperative to restrain the seat occupant,

drive means operative to drive said flexible member moving said retaining means between said first and second positions on said guide member,

a first switch which is manually controlled for energizing and de-energizing said drive means,

a second switch responsive to the arrival of said retaining means at said first position for energizing said drive means to be driven in a first direction to move said retaining means from said first to second position when said first switch is closed and simultaneously said retaining means is off said first position, and

a third switch responsive to the arrival of said retaining means at said second position for energizing said drive means to be driven in a second direction to move said retaining means from said second to first position when said first switch is open and simultaneously said retaining means is off said second position.

3,900,079

GROUND EFFECT MACHINE PRESSURE FLUID CUSHION CONFINING WALLS

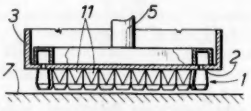
Jean Henri Bertin, Neuilly-Sur-Seine, France, assignor to Bertin & Cie, Plaisir, France

Filed Sept. 4, 1973, Ser. No. 394,056

Claims priority, application France, Sept. 5, 1972, 72.31401

Int. Cl. B60v *1/04*

U.S. Cl. 180—121 **4 Claims**



1. A ground effect machine having a rigid frame movable along a bearing surface with the interposition of pressure fluid cushions, comprising:

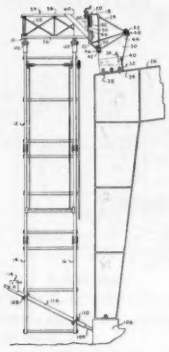
a plurality of individual skirts depending from said frame in juxtaposition next to each other along the periphery of said frame to form by their overall succession a peripheral enclosure for an inner cushion space between said frame and said bearing surface, each of said skirts having two opposite smooth side wall portions which are substantially planar and which extend from said frame over a substantial fraction of the overall extension of the skirt towards said bearing surface, said skirts being fitted so that the adjacent planar smooth wall portions of contiguous skirts tightly apply against each other in areal contact engagement, and

a fluid permeable flexible partition extending transversely across each skirt between those ends of the two opposite planar smooth wall portions thereof which are remote from said frame, said fluid permeable flexible partition being designed for offering some resistance to fluid flow therethrough from the inside of the skirt towards said bearing surface thereby causing a pressure drop upon traverse by said fluid flow and bulging towards said bearing surface to develop a force which extends the skirt away from said frame and stretches likewise both the planar smooth wall portions thereof.

3,900,080
SCAFFOLD APPARATUS

Donald E. Rea, Valparaiso, Ind., assignor to Spencer D. Jones, Hammond, Ind.

Filed Aug. 15, 1974, Ser. No. 497,824
Int. Cl.² E04G 3/14
U.S. Cl. 182—36 **11 Claims**

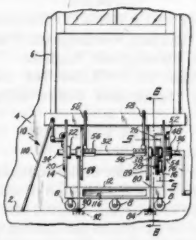


1. In a hanging scaffold apparatus, a cantilever member comprising:
- means for connecting scaffold poles to said cantilever member;
- a tandem wheel train connected to one end of said cantilever member;
- a wheel supported vertically spaced from said tandem wheel train;
- means supporting said wheel hingedly connected to said tandem wheel train; and
- means to adjustably move said wheel vertically spaced from said wheel train.

3,900,081
CABLE LADDER FIRE ESCAPE

Frank Dunston, 729 Irving St. N.W., Washington, D.C. 20010

Filed Mar. 18, 1974, Ser. No. 452,134
Int. Cl.² A62B 1/06
U.S. Cl. 182—73 **6 Claims**

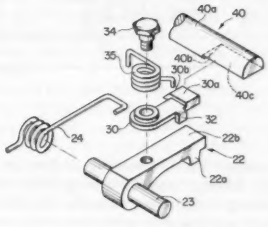


1. A portable fire escape device for use in conjunction with an opening provided in the wall of a structure, said structure including a floor and said floor having anchor hook means mounted therein spaced from and in alignment with said opening, said device comprising: base means movable on said floor into a position before said opening; a main shaft rotatably mounted generally horizontally on said base means; cable ladder means connected with said main shaft, and wrappable therearound for storage; anchor bar means engageable at one end with said main shaft and at the other end with said anchor hook means, and arranged to extend generally radially from the axis of said main shaft; and bearing means positioned between said main shaft and the said one end of said anchor bar means engageable with said main shaft, whereby said main shaft is rotatable relative to said one end of said anchor bar means.

3,900,082
ROD CONTROLLED POSITIVE LOCK BRAKE

Kenichi Sakamoto, and Tamio Kawamoto, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed May 31, 1974, Ser. No. 475,251
Claims priority, application Japan, June 8, 1973, 48-63853
Int. Cl. B62c 7/02
U.S. Cl. 188—69 **7 Claims**



1. A positively acting brake mechanism for braking comprising, a rotary shaft, a brake gear secured to said shaft, a brake pawl having a toothed surface radially of the brake gear and mounted for rotation about a first axis into and out of engagement with said brake gear, means biasing the pawl out of engagement with the brake gear, a plate connected to said brake pawl for rotation therewith about said first axis and for rotation relative to said pawl about a second axis along a plane perpendicular to the plane of rotation of said pawl, said plate having a cam portion with a lateral first wedge surface, a manually operable control element having a raised portion with a second wedge surface, said raised portion being engageable with said cam portion of the plate upon axial displacement of said control element in a direction for rotation of said brake pawl into engagement with the brake gear, and another biasing means biasing said plate to urge it to rotate about said second axis in a first direction toward engagement of the two wedge surfaces, whereby when teeth of the brake gear and the tooth of the brake pawl are misaligned, the second wedge surface abuts and is wedged against the first wedge surface during axial movement of the control element thereby urging the plate in a direction opposite to said first direction against a biasing force of said biasing means, and when the teeth of the brake gear and the tooth of the brake pawl are aligned with each other, said second wedge surface of said raised portion of the control element slides on the wedge surface of the cam portion of the plate during the axial movement of the control element and said raised portion rides on to the brake pawl to urge the brake pawl about said first axis into engagement with the brake gear.

3,900,083

SELF-RELEASING BRAKE DEVICE

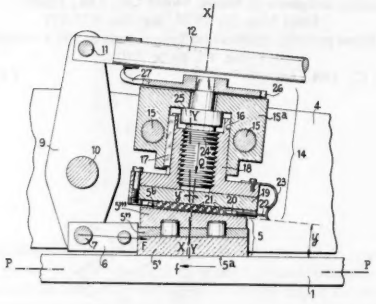
Jean-Marc Laurent Hauth, Pont-a-Mousson, France, assignor to Pont-a-Mousson A.G., Pont-a-Mousson, France

Division of Ser. No. 59,918, July 31, 1970, Pat. No. 3,727,727. This application Jan. 29, 1973, Ser. No. 327,735

Claims priority, application France, Aug. 11, 1969, 69.27515

Int. Cl.[2] F16D *55/228*

U.S. Cl. 188—72.2 **2 Claims**



1. A self-releasing friction braking device for braking a moving element having parallel rubbing faces on opposite sides of the moving element and movable in a plane in a first direction, said device comprising the following elements on each side of the moving element and arranged symmetrically relative to said plane: a fixed support element having a plane support face which makes an angle of substantially 20° with the corresponding rubbing face, a brake pad means having a plane friction face parallel to the corresponding rubbing face and an opposed plane bearing face which is parallel to said support face of said fixed support element, the plane friction face and the plane bearing face of each brake pad means being convergent in a direction opposed to said first direction and each brake pad means being the sole brake pad means associated with its corresponding rubbing surface, rolling elements interposed between and engaging said plane support face and said plane bearing face affording rolling contact between said plane support face and said plane bearing face, means for retaining said rolling elements between said plane support face and said plane bearing face, means defining a rigid base, adjustable mounting means for adjustably mounting said support element on said base and comprising a screwthreaded male member and a screwthreaded female member screwthreadedly engaged on said male member, one of said members being fixed relative to said base and the other of said members being rotatable relative to said base and having a toothed wheel connected to rotate with said rotatable member, a connecting rod movable relative to said base, means connecting said rod to said pad means to allow said rod to shift said pad means in a direction opposed to said first direction between the corresponding rubbing face and said support face for braking, and pawl means carried by said rod and engageable with and capable of rotating said toothed wheel in a single direction corresponding to movement of said rod in a direction for withdrawing said pad means from between the corresponding rubbing face and said rolling elements when wear of said pad means causes, when applying the brake, said rod to move an additional distance for braking which exceeds the distance between immediately adjacent teeth of said toothed wheel.

3,900,084

IMPROVEMENTS IN HYDRAULICALLY AND MECHANICALLY ACTUATABLE BRAKE SYSTEMS WITH AUTOMATIC ADJUSTERS

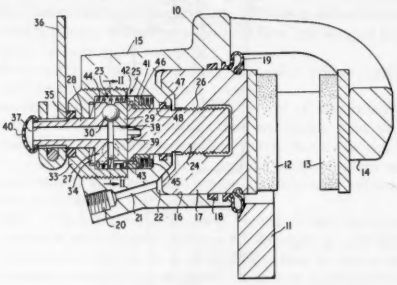
Glyn Phillip Reginald Farr, Leek Wootton, England, assignor to Girling Limited, Birmingham, England

Filed Feb. 25, 1974, Ser. No. 445,207

Claims priority, application United Kingdom, Feb. 23, 1973, 8868/73

Int. Cl. F16d *65/56*

U.S. Cl. 188—196 F **22 Claims**



1. An actuator mechanism for a vehicle brake comprising in combination, a hydraulic actuator having actuator components being movable apart to apply an associated brake by fluid pressure applied between said components, an auxiliary mechanical actuator and an automatic slack adjuster which is operative between one of said components of the hydraulic actuator and said mechanical actuator, wherein said mechanical actuator comprises a reversible face cam aligned with the hydraulic actuator axis and comprising first and second cam members having co-operative helically inclined surfaces thereon, said first cam member being axially fixed relative to said other hydraulic actuator component, one of said cam members being turnable for mechanical actuation of the brake, and wherein said slack adjuster comprises a first non-rotatable adjuster member and a second rotatable adjuster member in screw-threaded engagement therewith, said first adjuster member being associated with said one actuator component, said second adjuster member being disposed to be axially abutted by said second cam member, means being provided to enable the latter to turn the second adjuster member in one direction upon hydraulic operation when adjustment is required but not to turn the second adjuster member in the opposite direction.

3,900,085

IMPROVEMENT RELATING TO BRAKE ADJUSTERS

Anthony William Harrison, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Mar. 19, 1974, Ser. No. 452,560

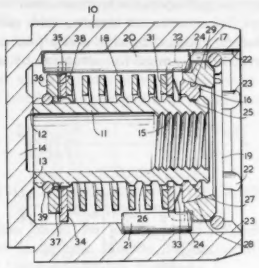
Claims priority, application United Kingdom, Mar. 20, 1973, 13204/73

Int. Cl. F16d *65/56*

U.S. Cl. 188—196 D **16 Claims**

1. In a piston for a hydraulic brake actuator: a slack adjuster for determining the retracted position of said piston comprising a non-rotatable strut having external screw-thread; a rotatable nut coaxial with the piston and having an internal screw-thread to mate with the external thread on said strut and so form a non-reversible screw-thread connection, said nut being axially displaceable and rotatable relative to said piston; a drive ring also coaxial with said piston and encircling said nut; a reversible screw-thread connection effective between said drive ring and one of said nut and piston; cooperating friction surfaces effective between said drive ring and the other of said piston and nut; resilient means axially biassing said drive ring in a direction to urge said friction surfaces towards one an-

other; and differential control means permitting rotation of said nut by said drive ring for adjustment but restraining reverse rotation of the nut during impact loading of the nut by the piston.

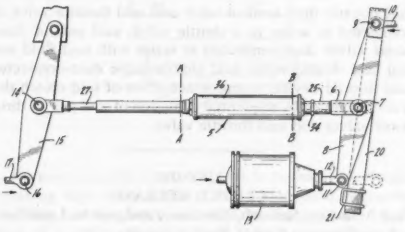


3,900,086

AUTOMATIC DOUBLE-ACTING SLACK ADJUSTER

Henry R. Billeter, Marco Island, Fla., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed Nov. 4, 1974, Ser. No. 520,408
Int. Cl. F16d *65/66*
U.S. Cl. 188—202 **10 Claims**



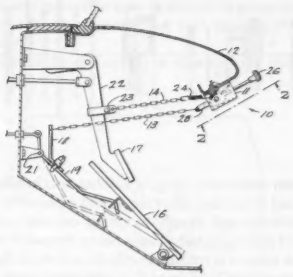
1. In an automatic slack adjuster for railway car brakes, a pull rod tube connected to one portion of the braking system, a threaded rod arranged telescopically within said pull rod tube and connected to another portion of the braking system, a plurality of spin nuts arranged on said threaded rod for rotation thereon, said spin nuts comprising a take-up spin nut, a let-out spin nut, and a lock-up spin nut, said let-out spin nut being located on said threaded rod between said other spin nuts, a clutching sleeve on one end of said pull rod, cooperating clutching surfaces between said clutching sleeve and said lock-up spin nut, a traction tube around said pull rod tube and said spin nuts, cooperating clutching surfaces between said traction tube and said clutching sleeve, cooperative clutching surfaces between said traction tube and said let-out spin nut, a trigger tube surrounding said pull rod tube, a housing around said threaded rod secured to said trigger tube, a trigger spring between said trigger tube and said traction tube, a let-out spring between said traction tube and said clutching sleeve, both of said springs being around said pull rod tube, a plurality of push pins slidably extending through said traction tube and having one end in engagement with said housing and the other end with said lock-up spin nut, and a slip cone clutch member arranged around said take-up spin nut, having cooperating clutch surfaces with each of said take-up spin nuts, said housing, and said traction tube, said slip cone clutch member operative in response to excessive deflection and stretching of the brake rigging to cause it to slip between said clutch surfaces and take up the slack in said slack adjuster and then to lock up the slack adjuster.

3,900,087

BRAKE RELEASED ACCELERATOR HOLDER

Michael A. Clare, Toledo, Ohio, assignor to Sidcor, Inc., Toledo, Ohio

Filed Mar. 25, 1974, Ser. No. 454,408
Int. Cl.² B60K *29/02*
U.S. Cl. 192—3 T **4 Claims**



1. A cruise control device for vehicles comprising:
a stationary base mounted within the vehicle;
a rotatable and axially translatable control rod supported by said base, said control rod including screw threads and a handle;
an abutment member pivotally connected to said base and having a flange extending under that end of the control rod opposite the handle, providing a backup against axial movement of the control rod in one direction;
a linkage member in threaded engagement with the control rod and positioned for axial movement along the control rod in response to rotation of the control rod;
a tension line connecting the linkage member with the accelerator linkage of the vehicle such that advancement of the linkage member along the control rod in a direction opposite said one direction will advance the accelerator position and movement of the linkage member in said one direction will allow retraction of the accelerator position under the influence of the accelerator return spring of the vehicle;
a tension line having a tension spring therein connecting a lateral arm of the abutment member with the brake pedal of the vehicle for pivoting the backup flange of the abutment member out from its backup position against the end of the control rod in response to movement of the brake pedal; and
a second spring of lower spring constant than the tension line spring, said second spring being disposed between the base and the lateral arm of the abutment member for biasing the abutment member flange toward its backup position.

3,900,088

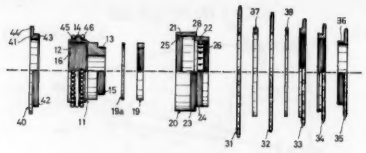
BICYCLE FREE WHEEL ASSEMBLY

Nobuo Ozaki, Sakai, Japan, assignor to Maeda Industries, Ltd., Sakai, Japan

Filed Jan. 26, 1973, Ser. No. 327,124
Claims priority, application Japan, Jan. 27, 1972, 47-10390
Int. Cl. F16d *16/00*
U.S. Cl. 192—64 **14 Claims**

1. A bicycle free wheel assembly comprising an inner ring adapted to be mounted on the hub of a rear wheel of a bicycle, an annular protuberance formed on the external circumference of said inner ring, an outer ring circumferentially spaced apart a short distance from said inner ring, said outer ring having an internal threaded portion formed adjacent to its inner end, a flanged cup having a flange member and a cup body, said cup body having an external threaded portion screwably attached to said internal thread of the outer ring,

said cup body being threaded in such a manner that said flanged cup is tightened when it is turned in the same direction as the bicycle wheel rotates, when driven, at least two series of balls interposed between said inner and outer rings, the inner series of balls being retained between said cup body of the flanged cup and the inner side wall of said protuberance



formed with said inner ring, a ratchet mechanism arranged between said inner and outer rings, and a plurality of sprocket wheels centrally and axially mounted on said outer ring, at least one of said sprocket wheels being threaded on the outer ring so that when it is rotated in one direction on the outer ring it actually moves at least one other sprocket wheel against said flange, locking said flange and inner sprocket wheel.

3,900,089

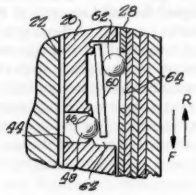
ONE WAY FLUID OPERATED COUPLING

John S. Ivey, Bloomfield, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed June 21, 1974, Ser. No. 481,945

Int. Cl. F16d *25/00*

U.S. Cl. 192—85 AA **8 Claims**



1. A control mechanism for an hydraulic motor for a friction engaging device including a piston member, a cylinder member receiving said piston, said piston and cylinder defining a fluid chamber, a valve in one of said members, fluid pressure in said chamber acting to close said valve, an actuator for said valve, rotatable means in said friction engaging device having relative rotation with respect to one of said members, one part of said actuator being in contact with said rotatable means, and a second part of said actuator having contact with said valve whereby in one direction of said relative rotation said valve will be opened by said actuator and in the other direction of relative rotation said valve will remain closed.

3,900,090

ENGINE REMOTE CONTROL

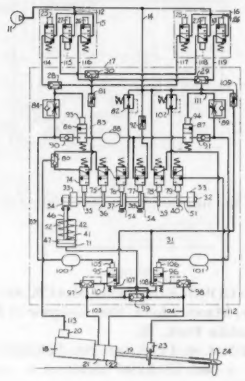
Jack R. Kobelt, 235 E. 5th Ave., Vancouver 10, British Columbia, Canada

Filed Aug. 27, 1973, Ser. No. 391,814

Int. Cl. F16d *67/02*

U.S. Cl. 192—.094 **15 Claims**

1. A remote engine control apparatus comprising a pressurized fluid source, clutch and throttle fluid control valves duct-connected in parallel to said pressurized fluid source, fluid controlled clutch and throttle devices, valve and ducting means interconnecting said clutch and throttle control valves respectively to said clutch and throttle devices, a pressure-proportional linear actuator means operatively duct-connected in parallel with said clutch device and said clutch control valve, an oscillating cam means operatively supported with respect to and operatively connected to said pressure-proportional linear actuator means, said valve and ducting means including a throttle valve and a pair of throttle-boost valves operatively mounted for actuation by said cam means,



said throttle fluid control valve and said throttle valve duct-connected in series to a shuttle valve, said pair of throttle-boost valves duct-connected in series with said fluid source and said shuttle valve, said shuttle valve duct-connected to said throttle device, whereby actuation of said clutch device is accompanied by sequential actuation of said pair of throttle-boost valves and said throttle valve.

3,900,091

CLUTCH RELEASE

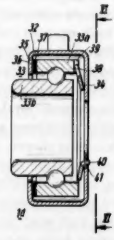
Paul Maucher, Sasbach, Germany, assignor to Lamellen und Kupplungsbau GmbH, Buhl, Germany

Filed May 10, 1973, Ser. No. 359,055

Claims priority, application Germany, Apr. 29, 1972, 2221231

Int. Cl. F16c *19/00, 33/30*

U.S. Cl. 192—98 **15 Claims**



1. A clutch release for motor vehicles or the like comprising a clutch operating means and a clutch disengaging means, a bearing means operatively associated with said clutch disengaging means for operating the latter, a stop means for said bearing means, an energy storage means providing a biasing force urging said bearing means and stop means towards one another, said clutch operating means being operable to lift said bearing means from said stop by a limited amount whereby said bearing means are moveable in a radial direction

to effect centering, and means providing a positive connection between said bearing means and said stop means when said bearing means and said stop means are biasingly urged into engagement with one another, said bearing means including a non-rotating ring part and said stop means having an engageable part, one of said parts having an elastic material thereon, and the other of said parts having a profiled portion which penetrates said elastic material when said stop means and bearing means are biasingly urged into engagement with one another.

3,900,092

AUTOMATICALLY OPERATED VEHICLE RESTRAINT MECHANISM

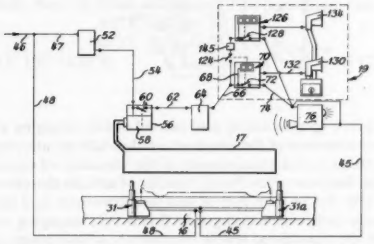
Frederick Walter Page, 10 Montana Rd., Wimbledon, and Peter Charles Darlington Wardle, 12 Hunter Rd., Wimbledon, both of London, S.W.20, England

Filed Mar. 7, 1974, Ser. No. 448,891

Claims priority, application United Kingdom, Mar. 9, 1973, 11638/73

Int. Cl.[2] G07C *1/30*

U.S. Cl. 194—9 T **25 Claims**



1. An automatically operated vehicle restraint mechanism for parking bays of determined orientation, said mechanism comprising sensing means actuated by the presence of any portion of a vehicle that is parked at least generally in such orientation and with such portion in any position in the parking bay, vehicle restraint means movable between an inoperative position in which movement of the vehicle into and out of the parking bay is not restrained by the restraint means and an operative position in which the movement of the vehicle out of the parking bay is restrained by the restraint means, a metering mechanism actuated by the sensing means for timing the presence of such portion of such vehicle in the parking bay, means actuated by the sensing means for moving the restraint means from the inoperative position to the operative position, means for de-activating said metering mechanism when it is desired to terminate the period of vehicle restraint, and means responsive to the de-activation of said metering mechanism for moving said restraint means from operative position to inoperative position.

3,900,093

COIN OPERATED TIMING DEVICE

John P. Bednar, Woodland Hills, and Harvey N. Weaver, Harbor City, both of Calif., assignors to Tele-Vend Systems, Woodland Hills, Calif.

Filed July 25, 1974, Ser. No. 491,689

Int. Cl.[2] G07F *5/02*

U.S. Cl. 194—9 T **1 Claim**

1. A coin operated electrical apparatus for providing uninterrupted service comprising:

a timing motor having a shaft adapted to rotate 360° in a substantially given time period,

an eccentric cam fixedly attached to said shaft,

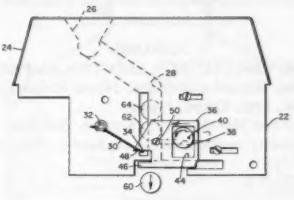
a cam follower controlled by said eccentric cam and restrained to move in a linear direction,

said cam follower has a bifurcated portion defining a pair of spaced-apart arms,

said spaced apart arms located in a spaced relationship free and clear of said eccentric cam,

each of said spaced-apart arms having an anchoring pin for supporting a pair of heavy duty resilient springs and in which said eccentric cam is forced between said resilient springs whereby rotation of said cam moves said cam follower,

a coin chute for accepting a plurality of similarly sized coins,



a switch connected in circuit with said timing motor and having an operating arm disposed in said coin chute whereby a coin placed in said chute will contact said arm, close said switch, and operate said timing motor, and

a pin fixedly attached to said cam follower and positioned to enter said coin chute and support said plurality of coins in excess of one,

said cam follower having a bifurcation defining a lower portion disposed in said coin chute for supporting coins and an upper portion for interfering with said operating arm when a coin is released.

3,900,094

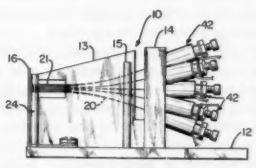
MATRIX PRINTER WITH OVERLAPPING PRINT DOTS

Raymond B. Larsen, and Donald E. Holmes, both of Riverton, Wyo., assignors to LRC, Inc., Riverton, Wyo.

Filed May 10, 1973, Ser. No. 359,013

Int. Cl. B41j *3/04*

U.S. Cl. 197—1 R **14 Claims**



1. A matrix printer head comprising in combination:

a plurality of print members having impression elements arranged in adjacent columns and disposed in confronting relation to a print medium, the impression elements in one column being offset vertically and laterally with respect to the impression elements in an adjacent column, said impression elements adapted to impress a matrix of dots to form each character on the print medium,

print member drive means for sequentially driving selected of the print members in each column to advance their impression elements forwardly into contact with the print medium whereby the dots formed in one column are vertically and laterally offset with respect to dots formed by the next adjacent impression elements of the adjacent column, and

printer head advancing means for incrementally advancing said printer head in a direction laterally of the print medium to a succession of incremental positions in forming

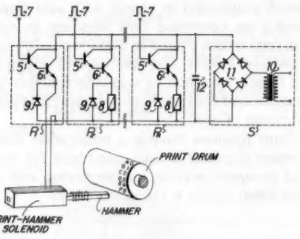
each character, the distance between incremental positions corresponding to the spacing between adjacent columns of said impression elements, said print member drive means sequentially driving selected of the print members in each column at each incremental position whereby the dots formed by driving selected of said print members in one column by said print member drive means will partially overlap and be vertically aligned with the next adjacent dots previously formed by driving of the print members of the adjacent preceding column at that incremental position, so that characters having apparent solid lines are formed by the matrix of dots when the printer head has been successively advanced through a series of incremental positions in forming each character.

3,900,095

DRIVING CIRCUITS FOR ELECTRICAL PRINTERS

Koji Tanabe, Higashi-murayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 31, 1973, Ser. No. 365,589
Claims priority, application Japan, June 6, 1972, 47-66539
Int. Cl. B41j *3/05*
U.S. Cl. 197—1 R **5 Claims**



1. A driving circuit for an electrical printer comprising:
a control-pulse supply circuit;
at least one driving transistor having an emitter electrode, a collector electrode and a base electrode, said base electrode being connected to said control-pulse supply circuit;
a solenoid having one terminal connected to the emitter electrode of said driving transistor and adapted to operate a mechanical print-driving member;
a capacitor connected directly to the collector electrode of said driving transistor and between said collector electrode and another terminal of said solenoid for generating an exciting pulse for energizing said solenoid and operating said mechanical print-driving member;
a current-supply circuit shunted across said capacitor, the terminal voltage of said capacitor being at a voltage higher than that of said exciting pulse; and
a two-terminal shunting element having a first terminal connected to said other terminal of said solenoid, and a second terminal element returned to said driving transistor for eliminating a counter-electromotive force produced in said solenoid upon de-energization thereof by cessation of said exciting pulse.

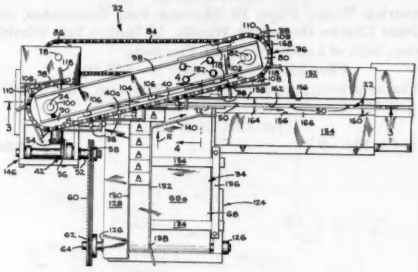
3,900,096

FEEDING MECHANISM FOR WRAPPING MACHINE

Michael R. Nack, and Donald C. Crawford, both of Green Bay, Wis., assignors to FMC Corporation, San Jose, Calif.

Continuation of Ser. No. 198,233, Nov. 12, 1971, abandoned. This application Aug. 16, 1973, Ser. No. 388,880
Int. Cl. B65g *47/52*
U.S. Cl. 198—23 **5 Claims**

1. A conveying apparatus for gently transferring a foremost article from an abutting row of articles supported on a feed conveyor onto a packing conveyor disposed generally normal to the path of said feed conveyor comprising: a transfer conveyor having an endless chain which includes a linear transfer run disposed diagonally across said feed conveyor and said packing conveyor; means defining a plurality of article engaging pushers secured to said chain at spaced intervals; said article engaging pushers each including a first article engaging wall disposed parallel to said feed conveyor and a second article engaging wall disposed parallel to said packing conveyor when said pushers are in said transfer run, and with said second wall of each following pusher disposed closely adjacent said first wall of each leading pusher along said transfer run, and means for continuously driving said feed conveyor and said packing conveyor and for driving said transfer con-



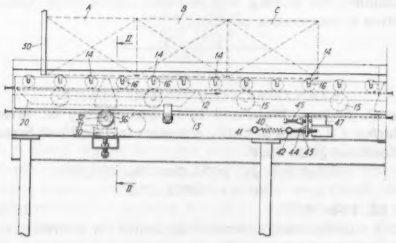
veyor at a speed causing said second article engaging wall to resist movement of the foremost article while the abutting row of articles moves continuously in the direction of movement of said feed conveyor during transfer of articles therefrom but at a rate slower than that of said feed conveyor, and simultaneously therewith causing said first article engaging wall to move the transferred article transversely of said abutting row of articles at a speed slightly slower than that of said packing conveyor until disengaged from said transfer conveyor, the article engaging pusher which follows the pusher that engages said foremost article being positioned so that the next following article in said abutting row of articles engages the second wall of said following pusher prior to moving said foremost article out of engagement with said next following article on said feed conveyor.

3,900,097

LIVE ROLLER CONVEYOR

Rowland J. J. de Courcy, Basingstoke, England, assignor to Douglas-Rownson Limited, Basingstoke, England

Filed June 26, 1974, Ser. No. 483,358
Claims priority, application United Kingdom, June 29, 1973, 31114/73
Int. Cl. B65g *13/02*
U.S. Cl. 198—127 R **4 Claims**



1. In a roller conveyor comprising side members, a plurality of rollers mounted to rotate freely between said side members

and a support carrying endless driving means which engages the undersides of said rollers, the improvement comprising means mounting at least one group of rollers and their supporting side members for movement as a unit in a generally horizontal plane in a direction opposite to the direction of conveying, resilient biasing means opposing said movement, a control member actuated by movement of said unit against said biasing means in excess of a predetermined amount, an indep endently powered mechanism actuated by said control member for separating the rollers of said unit from said endless driving means, and released by said control member when said control member is released by reverse movement of said unit, and braking means for engaging a few rollers at the leading end of said unit when said rollers are separated from said endless driving means.

3,900,098

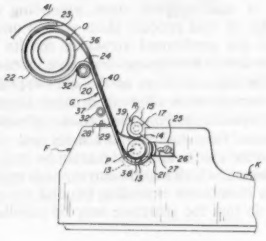
PAPER GUIDE AND SUPPORT FOR FREE PLATEN TYPEWRITER

Cecil S. Effinger, 828 Pearl St., Boulder, Colo. 80302

Continuation-in-part of Ser. No. 784,518, Nov. 22, 1968, Pat. No. 3,767,023, which is a continuation-in-part of Ser. No. 594,025, Nov. 14, 1966, abandoned. This application Oct. 18, 1973, Ser. No. 407,643

Int. Cl. B41j *11/04, 13/18*

U.S. Cl. 197—127 R **5 Claims**



1. A paper guide for a sheet of paper or the like having a width greater than the frame of a typewriter provided with a platen having free ends and means on said frame for supporting said platen, said guide accommodating a sheet of paper or the like having a width greater than said guide, comprising:

means providing a generally planar smooth surface having a width greater than said platen support means, for guiding said sheet downwardly and forwardly to the underside of said platen;

an approximately semicircular curl formed as an extension of said planar surface at each side and extending laterally outwardly from said frame, each curl being adapted to partially surround at least a portion of the length of said platen;

said guide being provided with an extension at each end corresponding in contour to said guide and movable away from said guide for a predetermined distance;

a pair of rods at each end of said guide connected to the respective end extension; and

a sleeve attached to the rear side of said planar surface for receiving each said rod.

3,900,099

TYPEWRITER RIBBON ARRANGEMENT

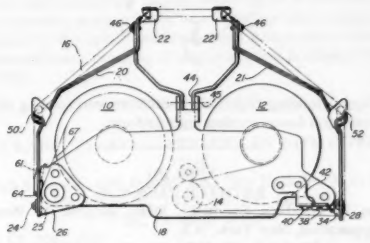
Hans-Georg Hengelhaupt, Nurnberg, Germany, assignor to Triumph Werke Nurnberg A.G., Nurnberg, Germany

Filed Aug. 16, 1973, Ser. No. 388,983

Claims priority, application Germany, Aug. 26, 1972, 2242141

Int. Cl.² B41J *33/58*

U.S. Cl. 197—159 **4 Claims**



1. A ribbon guide arrangement for business machines comprising:

support means,

a ribbon supply spool and a take-up spool rotatably mounted in spaced apart relationship on said support means,

first and second spaced vibrator levers,

means pivotally mounting one end of each of said vibrator levers on said support means,

ribbon guides at the other ends of said vibrator levers,

means for directing a length of ribbon from said supply spool, across said guides on said ends of said first and second vibrator levers and to said take-up spool.

and means for elevating said vibrator levers as a unit relative to said support means to present the ribbon length extending across said guides opposite a printing zone,

said means for directing said length of ribbon including a ribbon deflector member adjacent the pivot of said first vibrator lever to direct ribbon from said supply spool to said guides on said vibrator levers, and means on said support means for pivotally supporting said deflector member about a point intermediate its ends whereby on movement of said vibrator levers to elevate ribbon opposite said printing zone said deflector will adjust its position to accommodate ribbon stresses.

3,900,100

POP-UP CARTON CONSTRUCTION

Stephen J. Girman, Harleysville, Pa., assignor to The Lehigh Press, Inc., Harleysville, Pa.

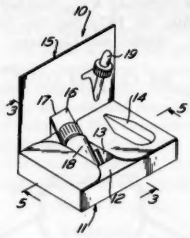
Filed Apr. 19, 1974, Ser. No. 462,311

Int. Cl.² B65D *79/00*

U.S. Cl. 206—45.13 **7 Claims**

1. A container construction comprising a lower section, a raised platform carried by said lower section, said platform having an opening defining an upwardly facing cavity, an upper section swingably connected to said lower section for movement into and out of overlying relation with said platform, a tongue swingably connected to and extending from said upper section into said cavity for movement into and out of the latter upon upper section movement into and out of said overlying relation, whereby an article of contents located in said cavity is movable with said tongue out of and into said cavity upon upper section movement out of and into said overlying relation, a pair of cover members extending from opposite sides of said lower section over said platform and

inwardly toward said cavity, a leg depending from each cover member into the adjacent region of said cavity, and ears on

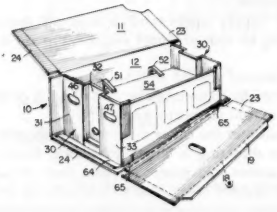


said legs extending angulately therefrom into spacing relation between said lower section and platform.

3,900,101
BATHTUB PACKAGE

James R. Goodsite, Sandusky, Ohio, assignor to Westvaco Corporation, New York, N.Y.

Filed Feb. 20, 1974, Ser. No. 444,021
Int. Cl.[2] B65D *5/32, 5/50, 85/54*
U.S. Cl. 206—320 **4 Claims**



1. A shipping container for bathtubs or the like in the form of a complete enclosure for said bathtub, comprising:

a. a single sheet outer wrapper portion including a series of interconnected panels which extend around the top, bottom and sides of said bathtub, said interconnected panels further including end flaps foldably attached at each end thereof;

b. a pair of end frame members fitted to the ends of said bathtub, each of said end frame members comprising a plurality of separate panels consisting of three primary panels, a pair of secondary panels, an end flap and a lower flap element formed side-by-side in a single blank of foldable material and arranged to support the ends of said bathtub in spaced relation from the ends of said outer wrapper wherein, the three primary panels are arranged so that two of said primary panels lie in a substantially common plane at the extreme edge of the bathtub outer wrapper and a third primary panel intermediate said two primary panels lies in an offset and substantially parallel plane adjacent to and in contact with the packaged bathtub, the two secondary panels lie in substantially parallel and spaced apart planes and connect the intermediate primary panel with the remaining two primary panels, the end flap is connected to the leading edge of one of the two primary panels and is folded around for protecting and cushioning the front face of the bathtub, and the lower flap element is connected to the lower end of said intermediate panel and is folded to lie adjacent and in contact with the lower surface of the side end flange of said bathtub;

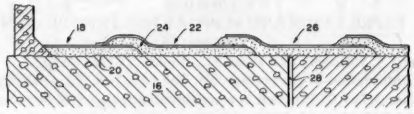
c. a pair of suspension pads separate from said end frame members and arranged to lie at each end of said bathtub between the single sheet outer wrapper and the two side end flanges of said bathtub; and,

d. means for fastening the outer wrapper panel end flaps to the said end frame members and the suspension pads.

3,900,102
WATERPROOFING MEANS AND METHOD

John Hurst, London, England, assignor to W. R. Grace & Co., Cambridge, Mass.

Continuation of Ser. No. 2,746, Jan. 14, 1970, abandoned, which is a continuation-in-part of Ser. No. 803,438, Feb. 28, 1969, Pat. No. 3,741,856, which is a continuation-in-part of Ser. No. 676,652, Oct. 19, 1967, abandoned. This application June 5, 1972, Ser. No. 259,998
Int. Cl. B32b *3/02*
U.S. Cl. 206—411 **3 Claims**

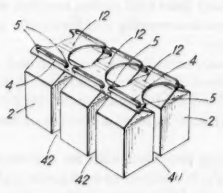


1. A preformed, flexible sheet-like structure suitable for application to concrete as a waterproofing structure, said structure being in the form of a roll alternate layers of (a) a flexible support sheet comprised of a synthetic organic polymer selected from the group consisting of polyolefin and polyvinyl chloride; (b) a waterproof and waterproofing flexible pressure-sensitive adhesive membrane adhered to one face of said support sheet, said adhesive membrane being at least 0.025 cm thick and of a self-healing bitumen-rubber composition wherein the ratio by weight of said bitumen to said rubber is at least 75:25, an edge of said membrane along at least one of the edges of said support sheet extending effectively beyond the edge of said support sheet so that unrolling and overlapping of the preformed structure results in a continuous membrane-to-membrane cohesive contact at the point where the support sheet of the overlapped structure ends; and (c) a protective siliconized paper sheet adherent to and readily releasable from the surface of said adhesive membrane remote from said support sheet and also readily releasable from the membrane on a margin on its face remote from the membrane, which margin corresponds to the portion of the adhesive membrane extending beyond the edge of the support sheet so that the structure may be unrolled without damage.

3,900,103
PACKAGES OF CONTAINERS

Robert H. Day, Bracknell, England, assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jan. 30, 1974, Ser. No. 438,104
Claims priority, application United Kingdom, Feb. 2, 1973, 5396/73
Int. Cl.[2] B65D *71/00, 75/00, 85/62*
U.S. Cl. 206—431 **1 Claim**



1. A package comprising a carrier and a plurality of pairs of containers, each of said containers having a generally gable-shaped top portion and a substantially flat strip of material

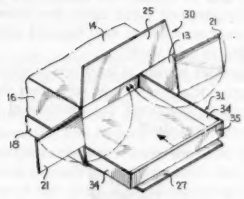
extending upwardly from the apex of said gable-shaped top portion, each end of each flat strip of each of said containers being formed to include a shouldered portion, said carrier comprising a strip of resilient sheet material having a plurality of pairs of slits equal in number to the number of pairs of said containers and each of said slits having a length less than the maximum length of said flat strip of each of said containers, each pair of slits disposed transversely of said carrier strip with each slit positioned parallel and adjacent to one longitudinal marginal edge of said carrier strip, the spacing between the slits of each pair of slits being greater than the maximum width of one of said containers measured in a direction perpendicular to the plane of said flat strip thereof, each of said flat strips disposed through one of said slits with the shouldered portions of said flat strip on the upper side of said carrier strip, and apertures forming handle means in said carrier strip between said slits.

3,900,104

TRAPEZOIDAL CONTAINER HAVING END-FLAPS THAT WEDGINGLY ENTRAP A TRAY

Frederick G. Harned, Bolingbrook, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 21, 1973, Ser. No. 362,394
Int. Cl. B65d *85/54, 5/38*
U.S. Cl. 206—491 **11 Claims**



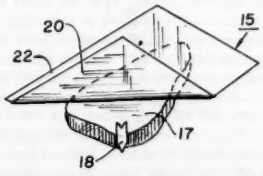
1. A package comprising a product and an enclosing container fully enclosing said product, said product including a tray having articles packed therein with opposite ends of said tray projecting beyond said articles, said container having side walls and ends closed by end walls, said container side walls being trapezoidal and said container end walls sloping towards one another remote from said tray and forming means wedgingly entrapping said tray.

3,900,105

INTERNALLY CONTAINED TEAR-INDUCING TAB FOR VACUUM SEALED PACKAGES

Robert O. Wolfelsperger, Fairfield, N.J., assignor to William E. Young, Atlantic Highlands, N.J.

Filed Apr. 19, 1974, Ser. No. 462,305
Int. Cl. B65d *3/26, 75/70, 17/20, 65/26*
U.S. Cl. 206—498 **7 Claims**



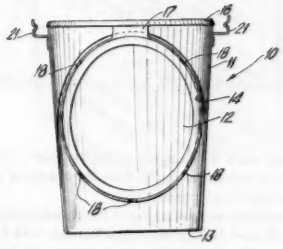
1. A package for enclosing a product of determined size and having a tear-inducing means, said package including: (a) a lower flexible film having a width and length greater than the product to be packaged; (b) a tear-inducing tab of relative thinness and having a substantial stiffness to resist bending of said tab and further having at least one sharp portion, said tab further placed on the lower film and so positioned that the pointed portion is directed toward an edge of the lower film and at a determined distance inwardly from the edge of the lower film; (c) a product of selected size and positioned on the lower film so that the periphery of the product is at least a short distance in from the ends and side edges of the lower film; said product also positioned so that the sharp pointed portion and a short adjacent portion of the tear-inducing tab extends beyond the periphery of the product, and (d) an upper flexible film of substantially the same size as the lower film the upper film drawn tightly around the top and sides of the product and sealed to the lower film as by heat sealing and the like and during the sealing of the upper to the lower film the projecting portion of the tear-inducing tab is peripherally retained by the upper and lower films which also enclose the upper and lower portions of said projecting portion of the tab member.

3,900,106

STACKABLE PLASTIC GARBAGE CAN WITH INTEGRAL TOP

Joseph Cantales, 640 Pelham Rd., New Rochelle, N.Y. 10803

Filed Nov. 26, 1973, Ser. No. 418,918
Int. Cl. B65d *21/02*
U.S. Cl. 206—519 **8 Claims**



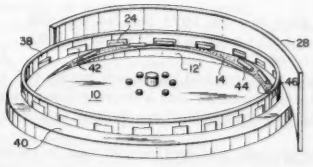
1. A stackable garbage can comprising:
a main body portion of generally cylindrical configuration having a concave recess portion on one side thereof and a bottom portion attached to the main body portion, and an integrally mounted cover to enclose said can which is connected to and pivotable about the upper edge of the can into the concave recess portion of the body to facilitate stacking of the can when said cover is moved into the recess.

3,900,107

ROTATING METHOD OF SORTING PARTICULATE ARTICLES

Kurt H. Hoppmann, Falls Church, Va., assignor to Hoppmann Corporation, Springfield, Va.

Filed Feb. 7, 1974, Ser. No. 440,408
Int. Cl.² **B23Q** *7/02, 7/12;* **B65H** *9/16*
U.S. Cl. 209—73 **20 Claims**



1. Rotating method of sorting particulate articles comprising:

A. radially distributing while accelerating said articles upon a rotating inner plane;

B. elevating said articles upon an inclined moving surface ramp rotating peripherally of said rotating inner plane, and

C. centrifugally carrying said articles away from the top of said ramp upon a rotating outer rim.

3,900,108

DISPLAY RACK FOR CARPETS

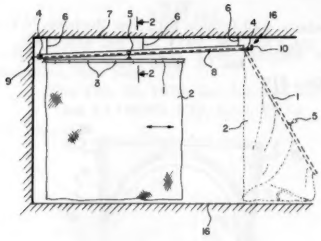
Robert Rottermann, Oberengstringen, and Fritz Fuchser, Neuheim, both of Switzerland, assignors to Robert Rotterman, Oberengstringen, Switzerland

Filed June 24, 1974, Ser. No. 482,410

Claims priority, application Switzerland, June 26, 1973, 9310/73

Int. Cl.² A47F *7/16*

U.S. Cl. 211—46 **5 Claims**



1. A display rack for hanging a display item, comprising:

an elongated holder having means for coupling to a display item an overhead support rail;

at least two hangers spaced apart from each other along the length of said holder and attached to said holder, said hangers each comprising a rod suspended from a roller, said rollers being separately removable from said rail only at the end of said rail adjacent display position; and

said overhead support rail comprising an inverted channel whose ends are turned horizontally inward to provide tracks for said rollers and to confine said rollers within said channel, an opening being provided in the top side of said inverted channel adjacent the display end for insertion and removal of said rollers into said channel, said channel further including stops at each end to prevent said rollers from running off the ends of said channel, whereby said hangers are positionable on said overhead support rail for movement of said holder along said overhead support rail from a storage position to a display position, and said holder can be removed from said overhead support rail by separately removing each hanger from said overhead support rail.

3,900,109

ELONGATED SURGICAL INSTRUMENT HOLDER

Wendell C. Peterson, 7107 Prospect Pl., Albuquerque, N. Mex. 87110

Filed Nov. 28, 1973, Ser. No. 419,599

Int. Cl.² A47F *5/13, 7/00;* **A61L** *7/00*

U.S. Cl. 211—60 T **5 Claims**

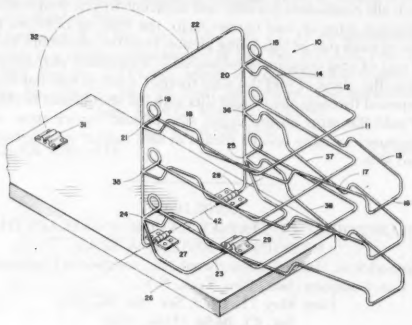
1. A holder for a surgical instrument having two pivotally joined elongated members with a finger gripping hole in the proximity of an end of at least one thereof, comprising:

a base,

a bracket pivotally mounted on said base to be moveable between a collapsed position substantially parallel to said base and to a position substantially perpendicular to said base, a wire shelf attached to and projecting outwardly from said bracket to receive the instrument thereupon,

said wire shelf having a portion being bent upwardly from the plane of the shelf and extending along a portion of each side adjacent a distal end thereof from said bracket, to arrest lateral movement of the instrument,

said wire shelf being bent upwardly along at least one portion thereof adjacent the bracket to form a post to engage the finger-gripping-ring of said at least one member of the



instrument and to release the instrument upon application of a longitudinal force upon the instrument, and a wire restrainer attached to said bracket extending therefrom parallel to said shelf,

said wire restrainer having at least one portion formed into a loop to provide a bias on said restrainer in the direction of said shelf to compress the instrument between said restrainer and said shelf.

3,900,110

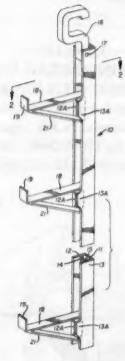
HANGER

John Soroka, Youngstown, Ohio, assignor to J & S Aluminum Inc., Youngstown, Ohio

Filed Nov. 18, 1974, Ser. No. 524,938

Int. Cl.² A47F *5/08;* **A47G** *29/02*

U.S. Cl. 211—113 **5 Claims**



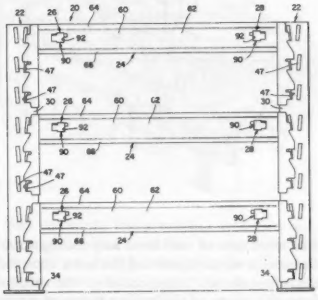
1. A hanger for suspending articles from a conveyor and consisting of a vertically positioned elongated body having spaced parallel flanges and a plurality of brackets, each of said brackets having a horizontal portion and a vertical portion, the vertical portions of the brackets being positioned between the spaced flanges of the elongated body and portions of the spaced flanges crimped thereagainst to retain the brackets in

position thereon and a hook on one end of said elongated body.

3,900,111
STORAGE RACK

Roy R. Hiler, Sewell, N.J., and Robert W. Hohl, Doylestown, Pa., assignors to Penco Products Inc., Oaks, Pa.

Filed Mar. 6, 1974, Ser. No. 448,735
Int. Cl.[2] A47F *5/10;* **F16B** *17/00*
U.S. Cl. 211—177 **6 Claims**

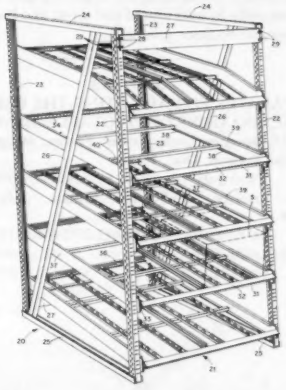


5. A storage rack comprising (a) a plurality of upright posts in pairs, each post of a pair connected to the other by braces, (b) horizontal beams extending between corresponding posts in adjacent pairs and having support members at each end connecting them for the beam's support to the respective posts, the direction in each post away the other post of the pair and the direction in each beam away from the beam between the other posts of two pairs being designated as the outward direction, each beam having an outward face recessed inwardly, the recessed portion of the outward face having two extended holes, one near each end of the beam, these holes each having a bottom which is relatively low for a stretch nearest the end of the beam, then enumerating in the direction away from that end, an upward step and a relatively high portion for a stretch, a downward step with a relatively low portion thereafter for a stretch, and then an upward step with a relatively high portion thereafter for a stretch and each beam having end faces recessed in a direction toward the opposite end face and having a vertical slot-type hole in each recess, the posts each having adjacent the end faces a vertical slot-type hole in a position approximately corresponding to that in the end face nearby, (c) strip members each held in the beam in limitedly movable positions respectively near each beam end, with each strip member having a sharply constricted neck positioned longitudinally between two larger portions, with the greater cross-sectional dimension of each strip member being upright and each strip member having an end outside the beam in the vicinity of the hole in the recessed face of the beam, its neck passing through that hole and its other end extending at least into the hole in the end of the beam, each strip member having one position in which that other end extends through that recessed hole in the beam end and at least into the corresponding hole in the post, the neck rests in the lower portion of the beam's outside hole which is nearer the beam end and the end of the strip away from the beam end leaves the end of that hole away from the beam end uncovered, and another position in which the end of the strip toward the beam end does not extend into the hole in the post but clears from the post, the neck of the strip is in the lower portion of the hole in the recessed outer face of the beam which is further from the end of the beam and the end of the strip away from the end of the beam covers the end of that hole away from the beam, with the rest of the strip in front and in back and through that hole substantially completely obscuring the view through that hole, and the strip and end holes in post and beam having relative dimensions and positions preventing the strip from carrying out any support function for the beam as far as the beam's support by the post is concerned.

3,900,112
GRAVITY STORAGE SYSTEM

Victor D. Azzi, Durham, and John Wyeth, Exeter, both of N.H., assignors to The Kingston-Warren Corporation, Newfields, N.H.

Filed Apr. 9, 1973, Ser. No. 348,997
Int. Cl. A47f *5/00;* **B65g** *13/12*
U.S. Cl. 211—148 **42 Claims**



1. In a gravity-feed, live storage system, in combination,
a plurality of vertical support frames;
a plurality of vertically spaced shelf frames mounted between said support frames, said shelf frames comprising front, back and side members;
supporting ledges formed on said front and back shelf frame members;
means for releasably-adjustably attaching said shelf frames to said vertical support frames;
gravity-feed track means installed between said front and back shelf frame members on their said supporting ledges;
positioner means fixedly associated with said front and back shelf frame members and endwise engaging said track means to align, longitudinally limit, and laterally fix aaid track means in structurally determined positions on said supporting ledges; and
retainer means associated with said front and back shelf frame members, said retainer means infacing from above, and extending downwardly to engage, portions of said track means under spring pressure and whereby said track means are clamped down against said supporting ledges in secure engagement under said retainer means.
36. In a gravity-feed, live storage system, in combination,
a plurality of vertical support frames;
a plurality of vertically spaced shelf frames mounted between said support frames, said shelf frames comprising front, back and side members;
supporting ledges formed on said front and back shelf frame members;
means for releasably-adjustably attaching said shelf frames to said vertical support frames;
gravity-feed track means installed between said front and back frame members on their said supporting ledges;
positioner means fixedly associated with said front and back frame members and endwise engaging said track means to

align, longitudinally limit, and laterally fix said track means in structurally determined positions on said supporting ledges; and

retainer means associated with said front and back shelf frame members and spring biasing said track means down against said supporting ledges,

said track means being of a length such that, and

said front and back positioner means and retainer means being of different extent endwise of said track means such that,

when fully inserted at their one ends in one of said front and back positioner means and retainer means, said track means clear at their other ends the other of said front and back positioner means and retainer means, and

when fully inserted at their other ends in said other of said front and back positioner means and retainer means, said track means are at their one ends engaged to and biased downwardly by said one of said front and back positioner means and retainer means.

3,900,113

APPARATUS FOR ADJUSTING THE RELATIVE INCLINATIONS OF PIVOTABLE MEMBERS

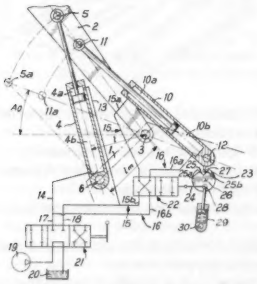
Bernard M. Bourges, Lagny Le Sec, France, assignor to Societa Anonyme Poclain, Oise, France

Filed July 17, 1974, Ser. No. 489,099

Claims priority, application France, July 19, 1973, 73.26559

Int. Cl.[2] B66C *23/54*

U.S. Cl. 212—35 HC **3 Claims**



1. Apparatus for changing the inclination of a pivotal element, the element being pivotal about an axis with respect to a fixed structure, the apparatus comprising a main jack connected between the structure and the element, and a secondary jack connected between the structure and the element, the main jack always being on the same side of said pivotal axis, the points of connection of the respective jacks to said structure and said element, and said pivotal axis constituting the vertices of two deformable triangles, the deformable triangle of which one side is defined by the secondary jack being flattened to form a straight line when the deformable triangle of which one side is defined by the main jack is substantially right-angled at its vertex defined by the point of attachment of said main jack to said structure.

3,900,114

CRANE APPARATUS

Tadao Inoue, Kashiwa, and Takeo Nakamura, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan

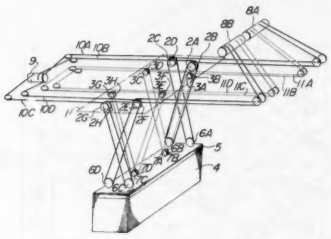
Filed Feb. 15, 1973, Ser. No. 332,546

Claims priority, application Japan, Oct. 11, 1972, 47-10035

Int. Cl. B66c *11/16*

U.S. Cl. 212—83 **28 Claims**

1. A crane apparatus comprising a trolley having a periphery, a load suspending device, load suspending rope means disposed at an incline between said trolley and said load suspending device in such a manner that the rope means does not suppress swinging movement of a load, and swinging movement suppressing rope means disposed at an incline between the trolley and the load suspending device in such a manner to suppress the swinging movement of the load, the distance as measured along a plane of said trolley between a support



point of at least one of said load suspending rope means on said trolley and a support point of the same rope means on the load suspending device being equal to the distance as measured along the plane of the trolley between a support point of at least one of the swinging movement suppressing rope means on the trolley and a support point of the same suppressing rope means on the load suspending device.

3,900,115

APPARATUS FOR SUPPLYING THIN, FLAT ARTICLES

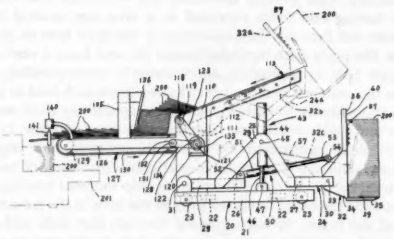
Naoki Kumagai, Yokohama, Japan, assignor to Itogihan Company, Ltd., Tokyo, Japan

Filed Nov. 22, 1972, Ser. No. 308,820

Claims priority, application Japan, Nov. 24, 1971, 46-93613; Dec. 27, 1971, 46-105242; June 12, 1972, 47-57704; June 21, 1972, 47-61314; June 23, 1972, 47-62312

Int. Cl. B65g *59/08*

U.S. Cl. 214—1 Q **6 Claims**



1. An apparatus for supplying thin, flat articles comprising:

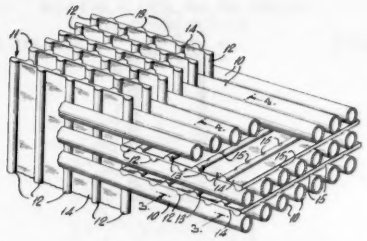
reversing means for reversing the direction toward which said articles face while in a piled condition; and

clearance making means for making at least one clearance space between a pair of side edges of said articles while said articles are being reversed, said clearance making means comprising at least one pantograph device having acting members for engaging said side edges of said articles and linkage means for connecting said acting members, said pantograph device stretching from a contracted condition to a separated condition while said articles are being reversed.

3,900,116
FUEL ELEMENT SHIPPING SHIM FOR NUCLEAR REACTOR

Aime Gehri, Richland, Wash., assignor to Exxon Nuclear Company, Inc., Richland, Wash.

Filed Sept. 5, 1972, Ser. No. 286,113
Int. Cl. B65g *1/14*
U.S. Cl. 214—10.5 R **14 Claims**



1. In a fuel assembly for a nuclear reactor comprising a plurality of elongated fuel elements having their longitudinal axes substantially parallel and arranged in spaced rows with each of said rows comprising more than one of said fuel elements, the improvement which comprises removable shim means extending along the length of said fuel assembly for preventing flexing of said fuel elements during shipment of said fuel assembly, said shim means comprising a first plurality of individual members having opposed ridged surfaces positioned between first adjacent rows of said parallel fuel elements with the ridged surfaces thereof extending in the same direction as said first adjacent rows and a second plurality of individual members having opposed ridged surfaces independent of said first plurality of members and positioned between second adjacent rows of said parallel fuel elements which rows extend in a direction perpendicular to that of said first adjacent rows and the ridged surfaces thereof extend in the same direction as said second adjacent rows, each of said first and second plurality of individual members being constructed and arranged to removably self-lock in position between said adjacent rows of said fuel elements, said first and second plurality of individual members being adjacent each other in alternating fashion for substantially the length of said fuel assembly.

3,900,117
FEEDING RING FOR FEEDING ORE INTO FURNACES

Frans Heikki Tuovinen; Seppo Ilmari Blomquist; Risto Markus Heikkilä, all of Tornio; Jorma Bruno Honkasalo, Westend, and Kalevi Johan Kunttu, Matinkyla, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Feb. 20, 1974, Ser. No. 443,977
Claims priority, application Finland, Feb. 26, 1973, 572/73
Int. Cl.[2] F23K *3/00*
U.S. Cl. 214—18 R **7 Claims**

1. A device for feeding and distributing a heated material, especially a charge of preheated ore concentrates into the batching silos of a light arc furnace, which comprises

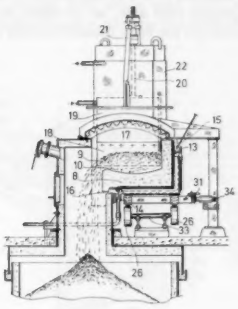
a ring shaped horizontal material shelf supported rotatably about its vertical axis and positioned above said batching silos,

a ring shaped roof mounted stationary above the material shelf and provided with at least one opening for pouring the heated material onto the shelf,

at least one stationary ring shaped wall joining the roof and closely related to the material shelf,

substantially gas-tight and dust-tight tightening means between the material shelf and stationary parts related thereto,

at least two working scrapers supported movably adjacent the shelf to be brought periodically near the shelf surface thereby deflecting material on the shelf over the shelf

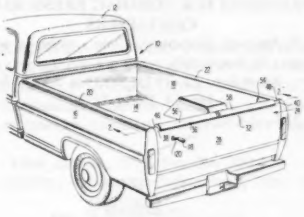


edge down into the batching silos, and a water cooled scraper box for each scraper into which the scraper is withdrawn periodically between periods of material deflecting operation.

3,900,118
LOADING TAILGATE FOR TRUCKS

James R. Kellogg, Rt. 2, Meridian, Idaho 83642

Filed May 20, 1974, Ser. No. 471,587
Int. Cl. B60p *1/52*
U.S. Cl. 214—84 **3 Claims**



1. In a truck body having a bed, and having side frames, a loading tailgate comprising:

tailgate end walls and tailgate inner and outer wall panels, the end walls being hingedly secured between the side frames of the truck body for movement between vertical and horizontal loading positions;

loading roller means secured rotatably between said end walls and projecting at least partially outwardly of said end walls and inner and outer panels; and

a brake system for the loading roller means, said brake system including a movable rod, and at least one brake pad moved by the rod to a position wherein it contacts the loading roller means and to a non-contact position.

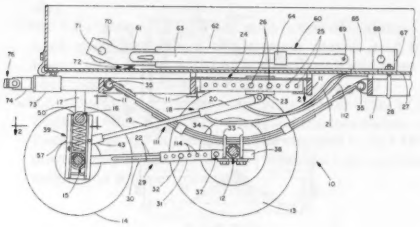
3,900,119
VEHICLE STABILIZED FOR HEAVY DUTY USE

Harold L. Olsen, Waukegan, Ill., assignor to Olsen Axle & Equipment Company Inc., Waukegan, Ill.

Continuation-in-part of Ser. No. 192,085, Oct. 26, 1971, abandoned. This application Feb. 7, 1973, Ser. No. 330,420
Int. Cl. B60p *1/54*
U.S. Cl. 214—86 A **8 Claims**

2. In a motor vehicle having a vehicle frame with a towing unit attached thereto for connection to disabled vehicles for purposes of towing such disabled vehicles and having perma-

nent front and rear axles and designed for operation with only two permanent axles and supported by wheels on the ends of said permanet axles, the improvement comprising a mounting assembly rotatably connected to the vehicle frame behind the rear axle for rotation about a mounting axis located above and to the rear of said rear axle, an auxiliary axle with auxiliary wheels mounted on the ends thereof carried by said mounting

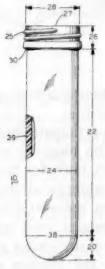


assembly and rotatable about said mounting axis between a lowered, load bearing position at the underside of said vehicle and a raised, load free position at the underside of said vehicle and forward of said mounting axis, actuating means connected to said vehicle frame and to said mounting means for moving said auxiliary axle between said lowered and raised positions, and locking means for locking said auxiliary axle in said lowered, load bearing position.

3,900,120
PREFORMS FOR FORMING PRESSURIZED CONTAINERS

Thomas F. Sincock, Simsbury, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 12, 1973, Ser. No. 331,842
Int. Cl. B65d *81/20*
U.S. Cl. 215—1 C **7 Claims**

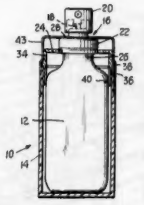


1. A tubular preform for molding into a container having at least a molecularly oriented portion, said preform being formed of a polymer wherein the major constituent is a polymerized nitrile-group-containing monomer, said preform having a substantially spherical bottom, an elongated body having a wall thickness of between 70 to 300 mils and a variation in wall thickness in the circumferential direction in a horizontal plane no greater than 20 percent, and a finished neck portion at the upper end of the body, the diameter of the neck portion being slightly greater than that of the body thereby forming a ledge for supporting the preform in a mold during formation of said container, the length of said preform below the neck being between 3 to 9 inches.

3,900,121
PACKAGE HAVING BOTTLE SUPPORT MEMBER THEREIN

Ralph E. Kruck, Waterbury, Conn., assignor to VCA Corporation, Richmond, Va.

Filed Nov. 16, 1973, Ser. No. 416,578
Int. Cl. B65d *23/08*
U.S. Cl. 215—12 R **11 Claims**



1. As new article of manufacture, a package comprising in combination:

a. an outer casing having a bottom wall, a sidewall and a top opening of substantially the same diameter as the inside diameter of said casing adjacent the top of said casing;

b. a bottle in said casing, said bottle having a neck portion and shoulder portion thereon;

c. a plastic support, insert member received in said top opening for steadying said bottle, said insert member including,

i. a flexible top wall portion,

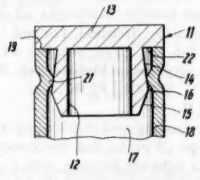
ii. a thin skirt portion depending from said top wall portion having at least a portion thereof engaging the interior surface of the sidewall of the casing adjacent its top opening, and

iii. said top wall having an opening therein adapted to at least partially encircle and to embrace the neck of the bottle at a point below the uppermost surface thereof so as to maintain the latter centralized with respect to the casing and prevent looseness thereof.

3,900,122
CONTAINERS WITH STOPPERS

Hans-Joachim Dichter, Sachendamm 93, 1 Berlin 62, Germany

Filed July 16, 1973, Ser. No. 379,379
Claims priority, application Germany, July 21, 1972, 2236528
Int. Cl. B65d *39/00*
U.S. Cl. 215—31 **2 Claims**



1. A glass bottle for storing tablets, dragees or the like in combination with a resilient stopper insertable in a cylindrical opening in the bottle, said stopper having a resilient plug portion widening conically towards the interior of the bottle and then tapering inwardly again, said plug portion cooperating with an annular locking means arranged on the inner wall of the opening, said locking means being a bead against which a section of the resilient plug portion which widens conically towards the interior of the bottle bears resiliently in the closed

position of the stopper, the bead and the wall adjacent thereto being of substantially the same thickness, the bead thus forming not only a locking means on the inner wall but also an annular groove on the outer side of the bottle.

3,900,123

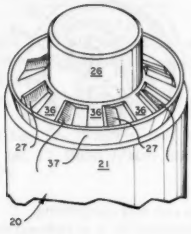
CHILD RESISTANT CLOSURE FOR COLLAPSIBLE TUBE

Henry S. Darlington, Aston, Pa., assignor to Teledyne Mid-America Corporation, Chester, Pa.

Filed Feb. 4, 1974, Ser. No. 439,549

Int. Cl.[2] B65D *55/02*

U.S. Cl. 215—216 **4 Claims**



1. In a collapsible container having

a. a flexible, collapsible tube closed at the bottom,

b. a shoulder on top of the tube,

c. an externally threaded neck extending from the shoulder, and

d. an internally threaded cap adapted to be threaded on the neck;

a child resistant closure comprising

a. lugs at circumferentially spaced positions on the shoulder, and integral therewith, wherein the lugs

1. are beveled on one side thereof, and abrupt on the side opposite the beveled side, and

2. are radially disposed,

b. radially disposed spokes extending integrally from the cap, and conforming to the shoulder of the tube when the cap is threadedly and fully engaged on the neck, said spokes being relatively thin and flexible in a direction longitudinal of the tube, and relatively wide and stiff in a direction rotationally of the tube, and a flexible ring surrounding and integrally secured to the spokes at the bottom of the ring,

wherein when the cap is screwed onto the neck of the tube the spokes flexibly come into contact with the lugs on the beveled side and ride over the lugs, and when the cap is unscrewed from the tube the spokes come into contact with the lugs on the abrupt side, whereby the cap is prevented from rotating, unless the spokes are lifted out of interfering engagement with the lugs.

3,900,124

MOLDED SYNTHETIC MATERIAL STOPPERS

Henri Marcel, Les Cheres, France, assignor to Le Bouchage Mecanique, Paris, France

Filed Dec. 14, 1973, Ser. No. 424,719

Claims priority, application France, Sept. 13, 1973, 73.33509

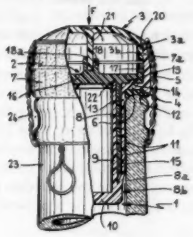
Int. Cl.[2] B65D *39/00*

U.S. Cl. 215—291 **16 Claims**

1. A stopper for closing the neck of a receptacle containing a beverage and for seating against its rim, comprising:

a hollow plastic stopper body comprising a head including an annular transverse base having a lower face shaped to overlie said rim and having an annular wall extending upwardly from an upper face of said base, and the body having at least one tubular skirt extending below the base and closed by a bottom wall at its free end, the diameter of the said skirt being smaller than that of said head and sized to enter the neck of the receptacle;

a liner of gas-impervious material comprising a transverse head of diameter larger than said skirt and snugly fitting within said annular wall above said base, and the liner having a tubular sleeve extending downwardly within and



lining said skirt nearly to its bottom wall, and the skirt being displaced inwardly against the sleeve when the skirt is in the receptacle neck;

a cap engaging said annular wall and closing the head of said body; and

resilient packing surrounding the skirt at said lower face of the body for compression between the annular base and the rim of the receptacle when the stopper is closing it.

3,900,125

CASE SEALED BY A COVER, A PROCESS FOR THE MANUFACTURE OF A CASE COVERED BY A FOIL AND EQUIPMENT FOR EXECUTING THE PROCESS

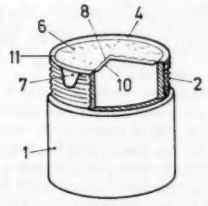
Eugen Wyler, Kusnach, and Max Buser, Zurich, both of Switzerland, assignors to Lovida AG, Oberwil, near Zug, Switzerland

Filed July 23, 1973, Ser. No. 360,450

Claims priority, application Switzerland, May 18, 1972, 7377/72

Int. Cl. B65d *23/00, 53/00*

U.S. Cl. 215—341 **11 Claims**



1. A container for cosmetic or pharmaceutical products comprising a case having an open end, defined by an upper rim, a foil fastened to the case and covering the open end; the foil stretched taut and smooth over the open end; and a cover secured to the case over the foil, the cover having a stamping insert which substantially depresses the foil below the rim in taut condition throughout the circumference of said case open end.

3,900,126
METALLIC CAN GLUED WITH SYNTHETIC RESIN PRODUCT

Katsukiyo Ishikawa, Yamatokouriyama, and Takayuki Shibata, Osaka, both of Japan, assignors to Nippon Paint Co., Ltd., Japan

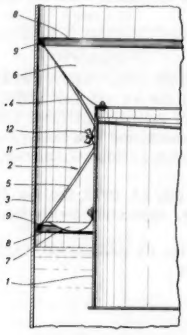
Filed July 3, 1973, Ser. No. 376,175
Claims priority, application Japan, July 3, 1972, 47-66538; Mar. 24, 1973, 48-33856
Int. Cl. B44d *1/02*
U.S. Cl. 220—75 **9 Claims**

1. A metallic can having a glued layer on the seam portion, which is characterized in that the glued layer comprises an olefin copolymer having a carboxyl group in the side chain and a polyurethane resin in a proportion of 5 : 100 to 100 : 5 by weight, the olefin copolymer being the copolymer of an aliphatic α-olefin having not more than 10 carbon atoms with an α,β-ethylenically unsaturated carboxylic acid having 3 to 8 carbon atoms, which has a melt index of 30 to 300 dg/min, and the polyurethane resin being the reaction product of an isocyanate with either a polyether or a polyester.

3,900,127
SEALING ASSEMBLY IN TANK

Karl Schwarz, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Nov. 30, 1973, Ser. No. 420,538
Claims priority, application Austria, Dec. 6, 1972, 10399/72
Int. Cl. B65d *87/18*
U.S. Cl. 220—216 **5 Claims**



1. In a large tank having a tankwall and a floating top which has a top rim and defines an annular gap with said tank wall, the provision of an assembly for sealing said annular gap, which assembly comprises

a flexible sealing skirt, which is sealed to the periphery of said floating top and bridges said annular gap,

a flexible cover, which slopes down toward and is tightly secured to the top rim of said floating top,

upper and lower resilient profiled sealing members, and

a plurality of peripherally spaced apart leaf springs, which are secured to the periphery of said floating top,

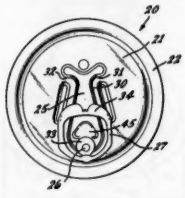
each of said leaf springs having diverging, upper and lower resilient legs, which extend upwardly and downwardly, respectively, from said floating top toward said tank wall, said upper legs having free ends, to which said cover and said upper profiled sealing member are secured and by which said upper profiled sealing member is forced into sealing engagement with said tank wall along a peripheral line thereof,

said lower legs having free ends, to which said sealing skirt and said lower profiled sealing member are secured and by which said lower profiled sealing member is forced into sealing engagement with said tank wall along a peripheral line thereof.

3,900,128
EASY OPEN CAN END RESISTANT TO PRESSURE

Omar L. Brown, Kettering, Ohio, assignor to Ermal C. Fraze, Dayton, Ohio

Filed Mar. 30, 1973, Ser. No. 346,712
Int. Cl. B65d *41/32*
U.S. Cl. 220—269 **20 Claims**



1. An easy-open can end comprising:

an end wall surrounded by a peripheral wall which defines the can chime,

a score line in said end wall defining a tear strip, tear strip being in said end wall and including a portion adjacent to said peripheral wall,

a tab means including a free end for pulling said tear strip away from said end wall by severing along said score line to form an opening which is larger adjacent said chime than in the center of said end wall,

a means affixing said tab means to said tear strip,

said free end of said tab means being positioned to overlie at least a portion the score line of said tear strip,

means in said tear strip of said can end for preventing said can end from assuming a permanently domed configuration when exposed to pressure from within said can tending to bulge said can end and permanently raising the free end of said tab means above said chime,

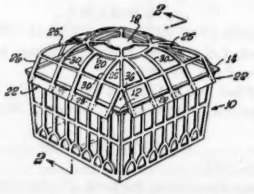
said means in said tear strip being a depression adjacent to said means for affixing said tab means, and

said depression having a depth in the portion thereof adjacent to said affixing means which is greater than the remaining depth of said depression.

3,900,129
COVER FOR RETAIL PRODUCE BASKETS

William A. Scholz, 132 N. Campus, Upland, Calif. 95486

Continuation-in-part of Ser. No. 170,774, Aug. 11, 1971, abandoned. This application May 4, 1972, Ser. No. 250,312
Int. Cl. B65d *43/10*
U.S. Cl. 220—306 **4 Claims**



1. A closure for a rectangular produce basket that has a rectangular rim formed with a downwardly facing rim shoulder, comprising:

a cover of rectangular plan configuration made of resiliently flexible plastic material and having four integral flaps on

its four sides to engage the four sides of said rim, respectively,

each of said flaps having two opposite side edges, the flaps being disconnected at their side edges to permit each of the flaps to be flexed independently of the other flaps, the four pairs of confronting side edges of the flaps defining four triangular recesses in the cover at the four corners of the cover;

upwardly facing hook elements formed on the inner sides of the four flaps near the outer edges thereof and extending inward from the flaps to engage said rim flange from the outer side thereof to releasably retain the cover on the basket.

3,900,130
INSERT FOR SECURING IN A HOLE

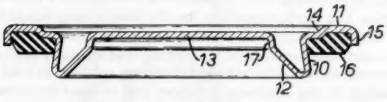
Sydney Alan Andrews, Stapleford, England, assignor to TRW Inc., Cleveland, Ohio

Claims priority, application United Kingdom, Jan. 26, 1972 3743/72

Filed Jan. 22, 1973, Ser. No. 325,781

Int. Cl. B65d *41/10, 39/04*

U.S. Cl. 220—378 **3 Claims**



1. An insert for assembly in a through opening in a thin plate of firm material, said insert including a tubular member which will extend through said plate opening, an outwardly extending flange part integral with one end of said tubular member, said flange part carrying an adherent layer of resilient sealing material which will overlie one side of said plate at the edge of the opening therein, and a re-entrant tubular part having an integral, terminal, transverse free end part, said re-entrant, tubular part being integrally joined to the end of said tubular member remote from said flange part in a single, smooth, reverse bend which will lie beyond, but relatively closely proximate, the edge of said plate opening at the other side of said plate so that said re-entrant tubular part will extend from said bend back through the opening in said plate and its transverse free end part will lie beyond said one side of said plate, said tubular member and said re-entrant tubular part each being formed from a firm but deformable material and each of said member and said part being generally convergent from said reverse bend toward their ends remote from said bend, the end of said tubular member remote from said flange part being radially expansible and axially collapsible to provide a bead of twice the thickness of the material forming said tubular member overlying said other side of said plate adjacent the edge of said plate opening to lock said insert in said opening and draw said sealing material tightly against said one side of said plate responsive to the application of an axial force to the free end part of said re-entrant tubular part which is effective to move said free end part to a position wherein it lies generally coplanar with said plate.

3,900,131
STUD FEEDER FOR STUD WELDING TOOLS

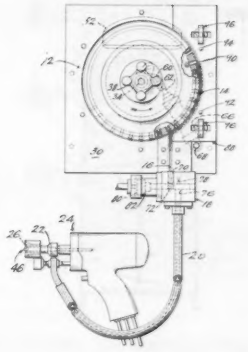
Don E. Ehrlich, Avon, Ohio, assignor to TRW Inc., Cleveland, Ohio

Continuation of Ser. No. 275,675, July 27, 1972, abandoned, which is a continuation of Ser. No. 41,691, May 25, 1970, abandoned, which is a continuation of Ser. No. 723,852, April 24, 1968, abandoned. This application Aug. 27, 1973, Ser. No. 392,128

Int. Cl. B65h *9/00*

U.S. Cl. 221—169 **5 Claims**

1. Stud feeding apparatus for feeding weldable studs, each having a head and a stem one at a time to a stud welding tool, said apparatus comprising a removable cover plate having a stepped arcuate edge forming a recess to receive stems of the studs, means forming a chamber containing a plurality of the studs, said chamber forming means including a base plate supported at an angle to the horizontal, and a hollow rotatable member having an annular edge located in a plane closely adjacent said base plate, means supporting said rotatable member for rotation about an axis perpendicular to said base plate and to the plane of said annular edge, said annular edge of said member having a plurality of notches extending thereacross and shaped to receive the studs from the chamber when in a predetermined orientation with the heads of the studs



adjacent said base plate, means spacing at least the stepped edge of said cover plate from said base plate a distance exceeding the thickness of the stud heads, the stepped edge of said cover plate and the annular edge of said hollow rotatable member cooperating with said base plate to form an arcuate track extending alongside a portion of said annular edge of said rotatable member and positioned to receive the studs which pass through said notches in said rotatable member from said chamber, with the stems of the studs in the stepped edge recess and the heads projecting between said cover plate and said base plate and also between said annular edge of said hollow rotatable member and said base plate.

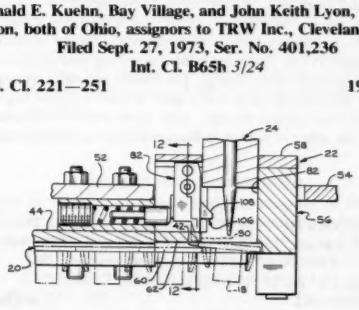
3,900,132
APPARATUS FOR HANDLING PARTS

Donald E. Kuehn, Bay Village, and John Keith Lyon, Wellington, both of Ohio, assignors to TRW Inc., Cleveland, Ohio

Filed Sept. 27, 1973, Ser. No. 401,236

Int. Cl. B65h *3/24*

U.S. Cl. 221—251 **19 Claims**



1. Apparatus for handling parts comprising means forming a transfer station, moving means for moving parts from said transfer station along a given path, guide means for directing parts sequentially into the path, part-control means including engagable means engagable by said moving means and engaging means for engaging a part adjacent said path, said engag-

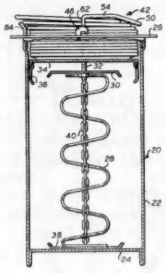
ing means moving that part away from said path when said engagable means is engaged by said moving means, and yieldably-mounted feet for yieldably holding the first part in the path of said moving means.

3,900,133

PLATE SEPARATOR FOR SELF-LEVELING PLATE DISPENSING

Arthur Lisbin, Upper Saddle River; George Ianney, Wayne Township, Passaic County, both of N.J., and James Albanese, Brookyln, N.Y., assignors to Levelator Corporation, Paterson, N.J.

Filed Mar. 25, 1974, Ser. No. 454,280
Int. Cl. A47f *1/06*
U.S. Cl. 221—280 **7 Claims**



5. A dispensing device comprising a container means containing a vertical column of articles to be dispensed, said container means having an opening through which said articles are dispensed, biasing means urging said column in one longitudinal direction towards said opening, operable means associated with said opening and engaging one longitudinal end of said column, said operable means including a first V-shaped portion disposed at an acute angle relative to the longitudinal axis of said column and cooperable with said biasing means to partially project said end article laterally to one side of said column to facilitate dispensing of said end article, said operable means including a second portion disposed generally perpendicular to the longitudinal axis of said column, said second portion having converging legs joined to respective legs of said V-shaped configuration of said first portion, said operable means further including a pair of upright portions each joined to a separate stop flange, said opening in said container means being surrounded by a flange, mounting means pivotally mounting one of said stop flanges to said container means flange, said mounting means includes a pivotal support lug, fastening means securing said support lug to said container means flange, pin means pivotally mounting said one stop flange between a part of said support lug and said container means flange, and latch means detachably latching the other of said stop flanges to said container means flange.

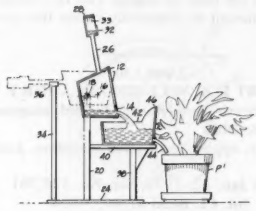
3,900,134

AUTOMATIC PLANT WATERING APPARATUS

Harold B. Larson, 260 Bay St., San Francisco, Calif. 94133

Filed Nov. 26, 1973, Ser. No. 418,885
Int. Cl.[2] B67D *5/08*; **A01G** *27/00*; **F16K** *17/36*
U.S. Cl. 222—52 **4 Claims**

1. Automatic plant watering apparatus comprising a first relatively large impervious substantially covered container having a center of gravity and pivotally supported by upright members extending from a base member for pivotal movement about an axis spaced in a first direction from said center of gravity so as to create a tipping moment about said axis, a lever arm attached to said first container and extending therefrom, a second substantially open container mounted on said arm in counterbalanced relationship to said first container and spaced from said axis, means for adjusting and slidably mounting said second container on said arm a vertical member extending from said base member limiting the movement of said lever arm to a horizontal position, and quantities of liquids within said first and second containers, whereby at a predetermined time the evaporation of liquid from the second



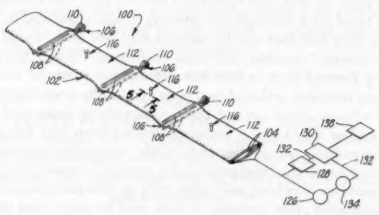
container eliminates the counterbalanced relationship of said containers causing said containers to move from a horizontal position to a vertical position thereby discharging liquid from said first container to an auxiliary container, means extending from said base member for supporting said auxiliary container subjacent thereto and in liquid receiving relation to said first container in the discharge position, and at least one conduit secured to said auxiliary container for conveying liquid therein to a remote site containing at least one plant.

3,900,135

LIQUID DISTRIBUTION SYSTEMS

James B. Stephens, La Crescenta, Calif., assignor to Westates Space-Era Products, Inc., S. El Monte, Calif.

Filed June 24, 1974, Ser. No. 482,372
Int. Cl. B67d *5/08*
U.S. Cl. 222—52 **18 Claims**



1. In a liquid distributing system in which liquid is conveyed through a conduit to a plurality of dispensing locations and is dispensed at each of said locations the improvement which comprises:

a plurality of separate holding means for holding a quantity of liquid, said holding means being connected at various points along the length of said conduit,

a plurality of separate dispensing means for dispensing liquid from said holding means, each of said dispensing means being associated with one of said holding means,

liquid supply means for supplying liquid under pressure at intervals to one end of said conduit,

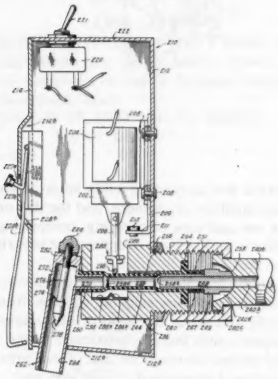
said holding means being capable of receiving and holding liquid when liquid is supplied to said conduit by said supply means so that as such liquid is supplied there will be a decrease in flow from said supply means when all of said holding means have received liquid supplied by said supply means, and

flow responsive detection means connected to said conduit, said detection means being responsive to a decrease in flow from said supply means into said conduit and being connected to said supply means so as to be capable of terminating liquid being supplied to said conduit upon a decrease in flow from said supply means into said conduit.

3,900,136
LIQUID DISPENSING APPARATUS

Archie V. Paranto, Dallas, Tex., assignor to Draft Meter Corporation, Dallas, Tex.

Filed Sept. 28, 1971, Ser. No. 184,603
Int. Cl. B67d *1/04*
U.S. Cl. 222—70 **4 Claims**

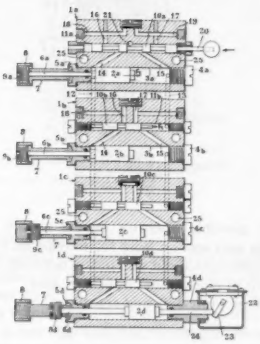


1. A liquid dispensing apparatus adapted for connection to a tap on a beer keg having an explosion chamber therein and wherein an outlet opening from the keg extends through the wall of the explosion chamber, the improvements comprising, a valve body having a bore extending therethrough and having a notch formed intermediate opposite ends of said bore; an orifice sleeve adapted to be positioned in sealing relation with a wall of an explosion chamber adjacent the outlet opening therein, said sleeve having a passage therethrough having a diameter substantially equal to the diameter of the outlet opening; an elongated resilient tubular member positioned about an end of said sleeve, said tubular member having a passage having an inside diameter substantially equal to the inside diameter of the passage through the sleeve to provide a smooth transition through said passages; means to secure said valve body to a tap such that the tubular member extends through the bore in the valve body and the orifice sleeve is urged into sealing relation with the wall of the explosion chamber; a closure element having a leg; support means secured to said closure element arranged such that said leg extends through the notch in the valve body and engages a wall of said tubular member to close the passage through the tubular member; and actuating means arranged to move the leg from engagement with said tubular member.

3,900,137
FLUID DISTRIBUTOR

Henri Bricout, deceased, late of Meudon, France, by Marie Bricout, Didier Bricout, Catherine Bricout, and Veronique Bricout, heirs, all of Meudon, France, assignors to Societe d'Applications des Machines Motrices, Issy les- Moulineaux, Haut-de-Seine, France

Filed Sept. 16, 1974, Ser. No. 506,189
Int. Cl.[2] G01F *11/38*
U.S. Cl. 222—309 **7 Claims**



1. A fluid distributor, for distributing from a single pipe under pressure a plurality of separate predetermined doses of fluid, comprising:

A. a series of devices each including

i. a dose-measuring cylinder having an outlet at each end,

ii. a dose-measuring piston movable in said cylinder,

iii. adjustable stop means determining the travel of said piston in said cylinder,

iv. a slide valve associated with said piston and having a smaller cross-section than said piston,

v. a cylinder receiving said slide valve and having its ends communicating each with a respective end of the dose-measuring cylinder of the next previous device of said series,

vi. a delivery conduit leading to a point to be supplied with fluid, said slide-valve controlling (a) intake of fluid under pressure selectively at one and the other end of said dose-measuring cylinder, and (b) connection selectively of one and the other outlet of said dose-measuring cylinder to said delivery conduit, and

B. a control block positioned upstream of the fluid distributor and serving as a pilot, said control block serving to operate the slide-valves of the respective devices of said series of devices automatically one after the other.

3,900,138
MEDICAMENT DISPENSER

Robert E. Phillips, Studio City, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

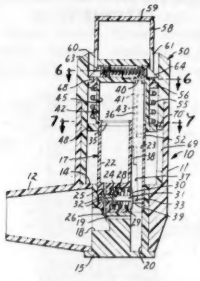
Division of Ser. No. 278,538, Aug. 7, 1972, Pat. No. 3,818,908.
This application Jan. 2, 1974, Ser. No. 430,219
Int. Cl. G01d *11/08*
U.S. Cl. 222—340 **3 Claims**

1. A canister for supplying medicament to a dispenser comprising:

a cylindrical shaped body member having a first axially extending bore extending toward one end and forming a reservoir, a second bore extending axially through said body member, said body having a third bore with a closed end extending generally diametrically thereto and com-

municating through axially aligned passageways with said reservoir and with said one end,

a piston slidably fitted in said third bore to form a pump, said piston having means affording selective communication of said third bore with said reservoir in a set position and with said one end in an expel position,



an axially movable operator having a cam surface positioned in said second bore for moving said piston,

a spring positioned about said piston normally urging it from said bore to engage said operator, and

a medicament stored in said reservoir.

3,900,139

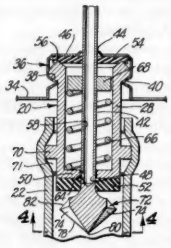
AEROSOL DISPENSING VALVE IMPROVEMENTS

Harold J. Myers, 585 W. Duarte Rd., No. 31, Arcadia, Calif. 91006

Filed Aug. 9, 1973, Ser. No. 386,870

Int. Cl. B65d *83/00*

U.S. Cl. 222—402.24 **10 Claims**



1. A dispensing valve for an aerosol dispenser for dispensing a particulate material which tends to agglomerate comprising:

a tubular housing having normally upper and lower ends,

a tubular valve stem extending centrally through and beyond the ends of said housing and having a central passage opening through the upper end of said stem and laterally through a port in the lower end of said stem,

an annular resilient wiper seal at the lower end of said housing surrounding and disposed in wiping contact with said stem,

a bearing member at the upper end of said housing guiding said stem for axial movement relative to said housing and seal between a lower open position wherein said port is below said seal and an upper closed position wherein said seal engages said stem below said port,

a spring within said housing above said seal and engaging said stem and housing for urging said stem to closed position, and

an enlarged agglomerate breakup head on the lower end of said stem having a lower pointed end and pointed teeth with relatively sharp axially presented cutting edges.

3,900,140

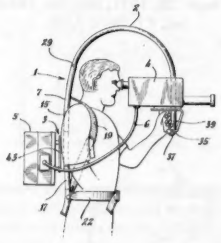
ROTATABLE CARRYING APPARATUS FOR VIDEO TAPE CAMERAS AND SIMILAR ITEMS

David Allen Kelso, North Bennington, and Robert James Howe, Bennington, both of Vt., assignors to K & H Products, Ltd., Bennington, Vt.

Filed Apr. 2, 1974, Ser. No. 457,237

Int. Cl. A45c *11/00*

U.S. Cl. 224—5 V **5 Claims**



1. A device for supporting units such as cameras, video cameras and auxiliary equipment, and the like on a person for mobility of use and ease of carrying, comprising:

a back frame and at least one strap for securing said frame to a wearer,

a substantially arcuate cantilevered arm pivotally secured to said frame and dimensioned to pass from said frame upwardly and about the head of the wearer to a position to support a unit thereon proximate to the wearer's face, pivotal means securing one end of said arm to said frame for rotational movement of said arm and

means at the other end of said arm for removably securing said unit to said arm,

said arm and frame being so dimensioned as to distribute the weight of the unit supported via said arm directly to said back frame and thence to the body of the wearer so as to locate the center of gravity of the support device and unit supported substantially over the body of the wearer to balance thereon,

whereby said frame and said arm support the unit on the wearer leaving the wearer's hands free and said arm may be selectively rotated between a position proximate the wearer's face for use and various positions to one side for additional use and non-use conditions.

3,900,141

METHOD OF AND APPARATUS FOR HANDLING WEB-IKE MATERIAL

Clifford Duckworth, 21, West Ln., Baildon, Shipley, Yorkshire, England

Filed Aug. 30, 1973, Ser. No. 393,090

Claims priority, application United Kingdom, Aug. 31, 1972, 40400/72

Int. Cl. B65h *17/38*

U.S. Cl. 226—53 **15 Claims**

1. A frame for supporting a piece of web-like material to be subjected to sample testing, the frame comprising:

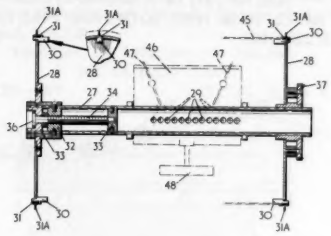
a. a shaft,

b. a pair of circular discs mounted on the shaft in longitudinally-spaced relationship,

c. a plurality of material-engaging pins on the circumfer-

ence of each circular disc, and

d. means between at least one of the circular discs and the



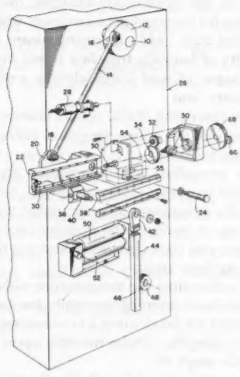
shaft and actuable to effect longitudinal displacement of the circular disc along the shaft.

3,900,142

ROLL FEED MICRO-ADJUSTMENT INDICATOR

Kurt A. Burtch, Middleville, and James A. Lewis, Hastings, both of Mich., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed July 15, 1974, Ser. No. 488,811
Int. Cl. B65h *17/22*
U.S. Cl. 226—100 **13 Claims**



1. In combination with a press roll feed having a connecting rod eccentrically securable to one end of a press crank shaft; a rocker member pivotally securable to the press, the other end of said connecting rod being secured to said rocker member to reciprocate said rocker about its pivotal axis; an adjusting block shiftably secured to said rocker member; a rotatable adjusting screw engaging said adjusting block to shift it on said rocker member; means to rotate said adjusting screw, and roll feed drive means drivingly secured to said adjusting block, the improvement in means to measure and to observe adjustment of said adjusting block comprising:

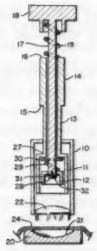
a digital indicator mounted on the pivotal axis of said rocker member having visually observable dials; means to index said dials, and drive means between said adjusting screw and said digital indicator indexing means to produce a linear read-out on said digital indicator dials equal to the length of material being fed by the roll feed.

3,900,143

DECORATIVE STUD SETTING TOOL

Otice Gallman, 11266 Malat Way, Culver City, Calif. 90230

Filed June 17, 1974, Ser. No. 480,094
Int. Cl.[2] B25C *5/02*
U.S. Cl. 227—109 **4 Claims**



1. A stud setting tool including:

a. a first cylindrical member having a first internal diameter corresponding to the diameter of a first sized stud for holding the stud;

b. a second cylindrical member having a second internal diameter lesser than said first internal diameter for holding a second smaller sized stud, said second cylindrical member being coaxially nested within said first cylindrical member;

c. a sleeve passing through said first cylindrical member to rigidly connect to said second cylindrical member; and,

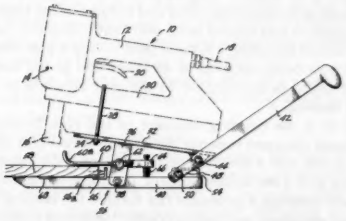
d. a plunger passing through said sleeve to terminate within said second cylindrical member whereby a stud held in said first cylindrical member can be ejected by telescoping movement of said sleeve through said first cylindrical member to cause said second cylindrical member to engage said stud and push it free of the first cylindrical member and whereby a smaller sized stud held in said second cylindrical member can be ejected by telescoping movement of said plunger through said sleeve to cause the end of the plunger to engage said smaller sized stud and push it free of said second cylindrical member.

3,900,144

FASTENING MACHINE

Haldon L. Hamilton, Crescent City, Calif., assignor to Hambro Forest Products, Inc., Crescent City, Calif.

Filed May 22, 1972, Ser. No. 255,565
Int. Cl. B25c *7/00*
U.S. Cl. 227—155 **1 Claim**



1. An attachment for use with a fastening machine including a head adapted to carry a fastener and means for ejecting a fastener from said head to drive the same into a workpiece, comprising:

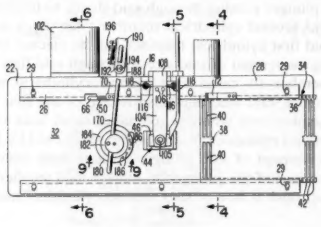
a mounting adapted to be secured to said machine,
a workpiece support pivotally carried by said mounting,
means interposed between said mounting and said support for swinging the support with respect to said mounting and for holding the support in a given position with respect to said mounting, said support having an anvil surface which becomes positioned in the path of a fastener ejected from the fastening machine with said support in said given position,
indexing means carried by the attachment adjacent said support for indexing the edge of a workpiece on the workpiece support,
and clamping means for clamping a workpiece on said support with the edge of said workpiece indexed by said indexing means, said clamping means comprising a spring biased arm overlying the support adapted yieldably to clamp a workpiece between the clamping means and the support, said arm including a second indexing means for indexing the edge of a second workpiece superimposed over the first-mentioned workpiece with said second workpiece overlying said anvil surface.

3,900,145

APPARATUS FOR INCREMENTAL MOVEMENT OF DIE FRAME

John C. Diepeveen, 1737 Kimberly Dr., Sunnyvale, Calif. 94087

Division of Ser. No. 297,506, Oct. 13, 1972, Pat. No. 3,840,163. This application Jan. 30, 1974, Ser. No. 438,137
Int. Cl. B23k *3/04, 37/04;* **H05b** *3/06*
U.S. Cl. 228—4.1 **7 Claims**



1. In a die bonding machine of the type having a generally horizontal plate provided with an opening and a heater element whose major portion is below the plate in alignment with the opening, the improvement comprising: a support; a heat shield for said heater element, said heat shield being transversely U-shaped and provided with a pair of opposed sides and a bottom; and means mounting the heat shield on said support, the support adapted to be secured to said machine at a location in which the sides and bottom of the heat shield are adjacent to and spaced from said heater element, said mounting means including a tubular post having a pair of open ends, said post being secured at its lower end to the support, said heat shield being coupled to the post adjacent to the upper end thereof.

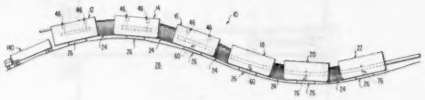
5. In a die bonding machine of the type having a heater element disposed beneath the path of travel of a die supporting frame and a microscope for viewing a die support of said frame above the heater element, the improvement comprising: means defining a generally flat surface for holding a plurality of die members; and means coupled with said surface-defining means for shiftably pivotally mounting the same on said machine at a location thereon permitting the surface to be moved horizontally into and out of proximity to said heater element, whereby a die support on said frame adjacent to said heater element and said surface can be simultaneously viewed through said microscope.

3,900,146

METHOD AND APPARATUS FOR LAYING PIPELINES

Oliver W. Fowler, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed Nov. 21, 1973, Ser. No. 417,720
Int. Cl.[2] B23K *31/02;* **B21D** *39/02;* **F16L** *1/00*
U.S. Cl. 228—103 **16 Claims**



1. An apparatus for fabricating a continuous elongate tubular member and for laying said member upon a ground surface comprising:
a plurality of longitudinally extending chambers;
means connected to each of said chambers to thermally insulate said chambers;
means for connecting said plurality of insulated chambers together end-to-end to form an articulated train of thermally insulated chambers;
means for providing enclosed thermally insulated longitudinal communication between adjacent ones of said insulated chambers while simultaneously permitting articulated movement between adjacent ones of said insulated chambers;
means positioned within said articulated train of chambers for forming tubular sections end-to-end into a continuous elongate tubular member;
means for supporting the tubular sections and at least a portion of the continuous elongate member fabricated therefrom for longitudinal movement with respect to said articulated train, said supporting means comprising
a plurality of laterally traveling hoists mounted within at least some of said longitudinally extending insulated chambers, and
normally extending cradle rollers connected with each of said means for connecting said plurality of insulated chambers;
means for propelling said articulated train of thermally insulated chambers along a desired underlying ground surface for advancing said articulated train from longitudinal support beneath the continuous elongate member and thus laying the continuous elongate member upon the ground surface; and
means for controlling the temperature within the interior of said articulated train of thermally insulated chambers.

10. A method for fabricating a continuous elongate tubular member and laying the tubular member upon a ground surface comprising the steps of:
providing a plurality of longitudinally extending thermally insulated longitudinal chambers connected end-to-end to form an enclosed articulated train with free axial communication between the thermally insulated chambers of the train, the train being suitable to extend along a ground surface and generally conform to the topography thereof;
supplying tubular sections to the articulated train in a preheated condition relative to the ambient environment surrounding the exterior of the articulated train;
maintaining a preselected temperature range within the interior of the articulated train;
connecting the tubular sections to the free end of said elongate tubular member extending within the articulated train of insulated chambers; and
advancing said articulated train from beneath the elongate tubular member to position said elongate tubular member upon the ground surface with a configuration of the elongate tubular member compatible with that of the topography of the underlying ground surface.

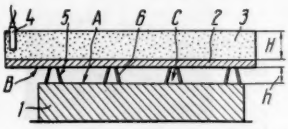
3,900,147
METHOD OF CLADDING METAL ARTICLES

Jury Ignatievich Apalikov, prospekt Lenina, 96, kv. 44; Jury Alexeevich Kozon, ulitsa Novaya, 6, kv. 41; Leonid Borisovich Pervukhin, ulitsa Jurina, 116, kv. 40, and Boris Davydovich Tsemakhovich, prospekt Lenina, 69, kv. 41, all of Barnaul, U.S.S.R.

Filed Nov. 13, 1972, Ser. No. 306,348

Int. Cl. B32b *15/00*

U.S. Cl. 228—107 **1 Claim**



1. In a method of cladding metal articles by explosive welding, including positioning a cladding article carrying a charge of detonating explosive in spaced relationship with a metal article forming a base member which is to be cladded therewith so as to provide a uniform spacing between their mutually facing welding surfaces, the improvement comprising: locating a plurality of upright, thin-walled hollow scattered elements at intervals over the entire welding surface between said cladding article and said base member; each said metal elements having a cavity open at opposite ends facing the respective welding surfaces of said base member and cladding article, the thickness of the walls of said hollow member being substantially constant along the height thereof and of at least one order smaller than the thickness of said cladding article; said metal elements being arranged so that a predetermined number of their ends surfaces concurrently form direct contacts with the welding surfaces of said cladding article and said base member so as to maintain said cladding article, together with the charge of detonating explosive, in contact with the welding surface of said base member, and maintain said spacing prior to the instant of explosive welding.

3,900,148
EXPLOSIVE WELDING OF SUBMERGED PIPES

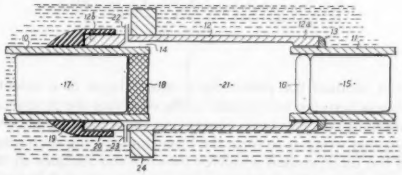
Michael Dickenson Chadwick; Peter Woodall Jackson, and Derek James Brown, all of Newcastle-upon-Tyne, England, assignors to International Research and Development Company Limited, Newcastle-upon-Tyne, England

Filed June 19, 1973, Ser. No. 371,509

Claims priority, application United Kingdom, June 21, 1972, 29128/72

Int. Cl. B23k *27/00*

U.S. Cl. 228—107 **7 Claims**



1. A method of explosively forming a joint between first and second tubular members submerged in a liquid comprising the steps of,

assembling one end of the first member, one end of the second member, shock absorbing elements, internal and external seals and an explosive charge to form a jointing assembly, and thereafter detonating the explosive charge to effect jointing of the said ends of the tubular members,

wherein the said assembling step includes the following steps carried out in any operative order,

a. arranging the said one end of the first member inside the said one end of the second member,

b. disposing an explosive charge within the said end of the first member,

c. disposing shock-absorbing elements in the bores of the two members on opposite sides of the explosive charge,

d. arranging internal and external seals to form a sealed enclosure comprising at least the space between said ends, and

e. displacing liquid from the said enclosure and replacing it with a gaseous medium.

3,900,149
METHOD OF PRODUCING ANTI-SKID STUDS FOR VEHICLE TIRES

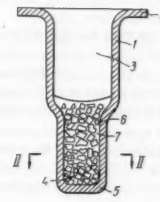
Boris Evgenievich Paton, ulitsa Kotsjubinskogo, 9, kv. 21; Vladimir Alexeevich Gusev, ulitsa Malopodvalnaya, 14, kv. 9; Daniil Andreevich Dudko, pereulok Mechnikova, 3, kv. 7; Boleslav Ivanovich Maximovich, Bulvar Lesi Ukrainki, 2, kv. 52, and Grigory Bagradovich Asoyants, Bulvar Lesi Ukrainki, 2, kv. 16, all of Kiev, U.S.S.R.

Continuation of Ser. No. 214,324, Dec. 30, 1971, abandoned. This application May 4, 1973, Ser. No. 357,273

Claims priority, application U.S.S.R., Jan. 4, 1971, 1603843; Feb. 16, 1971, 1618804

Int. Cl. B23k *31/02*

U.S. Cl. 228—122 **1 Claim**



1. A method of producing an anti-skid stud for vehicle tires, comprising the steps of: forming from a metal blank a sleeve with a stud body having a closed cavity projecting from a peripheral flange; charging the cavity of the said sleeve with granular material comprising a granular pre-selected hard alloy and a granular binder-alloy; heating said stud body charged with the said granular materials in a protected atmosphere preventing oxidation, to a temperature exceeding the melting point of the binder-alloy by a temperature in the range of 50°–150°C to insure and cause wetting of said granular material and at least part of the inside surface of said stud body and forming an integrated and a consolidated hard core of said granular material integrally and intimately adhered to the sleeve cavity in the anti-skid stud produced;

and subsequently heating the charged stud in a second and additional stage to a temperature of 400°–450°C for a duration of 12–24 hours;

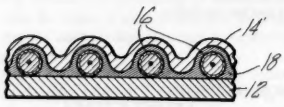
and subsequently cooling the stud;

wherein said charging step includes charging the stud cavity with 0.5–0.7 g. of a first material comprising by percentage of weight of 15% titanium carbide, six percent cobalt and the remainder being tungsten carbide; including in the charge 0.5–0.7 g. of a second material including, by percentage weight, 8% cobalt and the remainder being tungsten carbide; and forming the remainder of the charge as 0.4–0.6 g. of the granular binder-alloy containing by percentage of weight 30–40 % nickel, 30–40 % manganese and the remainder as copper.

3,900,150
DUPLEX COMPOSITE TAPE

Eugene J. Delgrosso, Wallingford, and Carl E. Carlson, East Hartford, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Aug. 22, 1974, Ser. No. 499,654
Int. Cl.[2] B23K *28/02*
U.S. Cl. 228—185 10 Claims



1. A method for the manufacture of fiber-reinforced metal matrix composites comprising the steps of:
positioning a plurality of evenly spaced reinforcing members on a first surface of a metallic sheet comprising the matrix metal;
depositing a layer of a first alloy of the matrix metal over the reinforcing members;
providing a layer of a second alloy of the matrix metal on an exposed surface of the sheet-first alloy layer intermediate thereby forming a fiber-reinforced metal matrix tap intermediate the second alloy being selected to have a lower melting point than the first alloy;
stacking a plurality of thus formed tapes; and
bonding the stacked tapes together while preventing contact of liquid metal with the reinforcing members.

9. A braze bondable metal matrix tape comprising:
a metallic foil, said foil including aluminum;
a plurality of evenly spaced parallel oriented reinforcing fibers positioned on a first surface of said foil;
a thin layer of a first aluminum alloy bonding the fibers to the foil, said first alloy contacting only the fibers and said first surface of the foil; and
a layer of an aluminum braze alloy in contact with an exposed surface of the fiber-foil-first alloy layer matrix, said braze alloy having a lower melting temperature than said first alloy.

3,900,151
JOINING PROCESS

Heinz Schoer, Alfter, and Werner Schultze, Bonn, both of Germany, assignors to Vereinigte Aluminium-Werke Aktiengesellschaft, Bonn, Germany

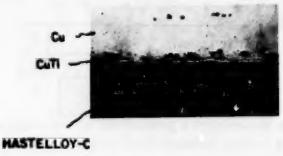
Division of Ser. No. 285,099, Aug. 29, 1972, Pat. No. 3,807,033, which is a continuation-in-part of Ser. No. 98,173, Dec. 14, 1970, abandoned. This application Dec. 4, 1973, Ser. No. 421,655
Claims priority, application Germany, Sept. 2, 1971, 2143966The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.
Int. Cl. B23k *35/28, 35/38*
U.S. Cl. 228—220 8 Claims

1. In a process of soldering aluminum-containing workpieces, the step of soldering said workpieces with a Zn base solder comprising 2–26% by weight of Al, and Be as a wetting agent, said Be lowering the viscosity and surface tension of said solder in its molten state and substantially decreasing the interfacial tension between the molten solder and said workpieces, and said step being performed without a flux and in a substantially non-oxidizing atmosphere.

3,900,152
METHOD OF METALS JOINING

David L. Purdy, and John F. Williams, both of Indiana, Pa., assignors to Arco Nuclear Company, Leechburg, Pa.

Division of Ser. No. 127,807, March 24, 1971, abandoned, which is a division of Ser. No. 624,916, March 21, 1967, Pat. No. 3,599,317. This application June 27, 1973, Ser. No. 374,013
Int. Cl. B23k *31/02, 35/38*
U.S. Cl. 228—221 1 Claim

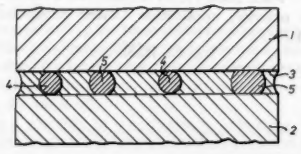


1. The method of producing an assembly composed of a member of one of the class of nickel alloys consisting of the alloys C,X and B, having respectively substantially the following compositions, C = Ni 54%, Mo 16%, Cr 15.5%, Fe 5%, W 4%, Co 2.5%, C 0.08, other 2.92%, X = Ni 47%, Cr 22%, Fe 18%, Mo 9%, Co 1.5%, W 0.6%, C 0.1%, other 1.8%, B = Ni 61%, Mo 28%, Fe 5%, Co 2.5%, Cr 1%, C 0.05%, other 2.45%, and a member of copper, the said method comprising, interposing a thin mass of titanium between said members to form a joint between said members, placing said members with said joint between them in an evacuated atmosphere, heating said joint to a temperature at which said joint becomes liquid, and then cooling said joint to permit it to solidify.

3,900,153
FORMATION OF SOLDER LAYERS

Wolfgang Beerwerth, Neheim-Husten; Albrecht Geppert, Warstein, and Rigobert Schimmer, Belecke, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed June 13, 1973, Ser. No. 369,495
Claims priority, application Germany, June 13, 1972, 2228703
Int. Cl. B23k *1/12*
U.S. Cl. 228—246 35 Claims



1. A method for producing a solder layer of a selected thickness between two parallel surfaces during the production of semiconductor devices, comprising: incorporating additives into solder which is to form the layer; introducing such solder with the incorporated additives between the surfaces so that the additives extend between, and contact, the surfaces; subjecting the solder to time and temperature conditions which cause it to form the desired layer; and giving the additives dimensions such that during the formation of the layer the distance between the two parallel surfaces contacting the additives corresponds to the desired solder layer thickness, the additives being so selected that their dimensions can change only within predetermined limits under said time and temperature conditions.

3,900,154
ASH COLLECTOR

William F. Martin, 350 Stonycroft Rd., Ridgewood, N.J. 07450

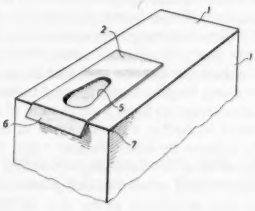
Filed Dec. 19, 1973, Ser. No. 426,342
Int. Cl. B65d 3/00
U.S. Cl. 229—1.5 R 1 Claim

1. An ash collector of integral construction comprising a chute section and a receptacle section communicating therewith, said chute section being tapered, open at both ends, and having an opening in its top portion extending the full length thereof, said chute section having side walls which are partially rolled and integral extensions of its bottom wall, said receptacle section having an end wall and an opposing end portion open for communication with the chute section, bottom and rolled side walls integrally extending from the corresponding walls of the chute section and a top wall formed by overlapping and securing together the further rolled integral extensions of the side walls of said chute section whereby ashes and the like may be introduced into the end and through the top at any point along the length of said chute section and then contained within said receptacle section.

3,900,155
PACKAGE

Hans A. Rausing, Lund; Jan-Erik Olsen, Malmo, and Jan Axel Ingemar Rauser, Lomma, all of Sweden, assignors to Tetra Pak Development SA, Lausanne, Switzerland

Filed Feb. 11, 1974, Ser. No. 441,218
Claims priority, application Switzerland, Feb. 20, 1973, 2410/73
Int. Cl.[2] B65D 5/12
U.S. Cl. 229—7 R 5 Claims

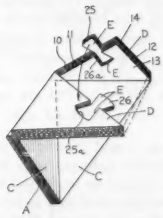


1. A disposable package comprising a container body formed of a laminated material having a support layer and an outer layer of heat sealable thermoplastic material thereon and having a flat top panel provided with a pouring opening therein, a closure strip covering said opening, at least a portion of said closure strip being sealed to the outer layer of the top panel in the area surrounding said opening, that portion of said strip which covers said opening being recessed into said opening, said recessed portion extending into said container body beyond the inner surface of said top panel and having a surface parallel to the inner surface of said top panel and an area larger than that of said opening to releasably engage the periphery of said opening and secure the recessed portion of said strip within said opening, a portion of the closure strip remote from said opening being folded under through 180° and sealed to the outer layer of said top panel, said outer layer being scored beneath said closure strip between the pouring opening and the portion of said strip which is folded under to resist tearing, when said package is opened, of the outer layer where the folded portion of said closure strip is sealed to said outer layer.

3,900,156
CORNER PAD

Alexander B. Clark, Jr., Box 2012, Hendersonville, N.C. 28739

Filed May 16, 1974, Ser. No. 470,655
Int. Cl.[2] B65D 25/12
U.S. Cl. 229—14 C 5 Claims



1. A protective shield for use on corners of articles during shipment comprising:

a flat, fluted cardboard blank;

an intermediate substantially triangular portion of said blank bounded on each side and the base on the underside thereof by slit scores;

an intermediate slit score on the underside of said intermediate portion extending from adjacent the apex to substantially the mid point of the base of said intermediate triangular portion;

a first pair of triangular flaps, each carried by a first mentioned slit score at each side of said intermediate portion;

a second pair of triangular flaps, each carried by the other first mentioned slit score at said base each extending substantially to the mid-point thereof, each flap presenting a free side extending from said base;

a third pair of triangular flaps, each carried by a slit score and foldable in superposed relation to an adjacent one of said second pair of flaps;

a first tab projecting outward from one of said free sides and a first notch carried by the other of said free sides complimentary to said first tab for receiving same; and

a second tab projecting outward from one of said third pair of flaps and a second notch carried by the other of said third pair of flaps complimentary to said second tab for receiving same;

whereby said tabs join said free sides when said first pair of flaps are folded inwardly to overlay said intermediate portion and said second and third pairs of triangular flaps folded into engagement.

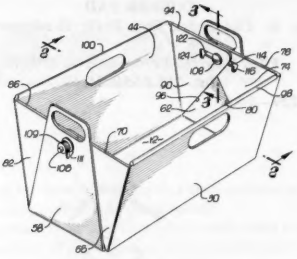
3,900,157
TUB FILE

Herman P. Roth, 211 Anderson St., Manhattan Beach, Calif. 90266

Filed Mar. 19, 1974, Ser. No. 452,601
Int. Cl. B65d 5/20
U.S. Cl. 229—16 D 8 Claims

1. A structure comprising:

a generally flat, single unitary shaped panel having a plurality of subpanels defined therein, said subpanels including a generally rectangular base subpanel having two side edges and two end edges, a first side subpanel flexibly attached to one of said side edges, a second side subpanel flexibly attached to the second of said side edges, a first end subpanel flexibly attached to one of said end edges by a first flexible hinge, a second end subpanel flexibly attached to the second of said end edges by a second flexible hinge, each of said first and second side subpanels being generally rectangular and having two longitudinal edges and two transverse edges, four flap subpanels, each of said flap subpanels being



flexibly attached to a said transverse edge, said transverse edges being generally colinear with said end edges, said subpanels being adapted to be folded together into a compact packaged configuration and assembled into a convertible box-tub configuration, said first and second flexible hinges being elongated to accommodate the folding of said first and second end subpanels over the combined thickness of one of said flap subpanels and one of said side subpanels, fastening means for holding said subpanels together in said convertible box-tub configuration, said fastening means permitting at least one of said side subpanels to move pivotally about the said side edge to which it is flexibly attached between a box configuration and a tub configuration.

3,900,158

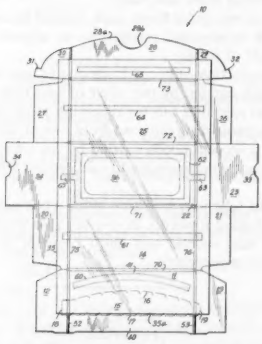
DISPENSER CARTON

Thomas W. Berkhouse, Cincinnati, Ohio, assignor to International Paper Company, New York, N.Y.

Filed Oct. 26, 1973, Ser. No. 410,291

Int. Cl.[2] B65D *5/56, 5/54, 5/72*

U.S. Cl. 229—17 S **6 Claims**



1. In combination with a box having a bottom wall, a back wall, a top wall, a front wall and an end closure means, the improvement which comprises:

a. a front panel foldably connected to said top wall, said front panel including,

i. at least one transverse tear line extending across said front panel, said at least one tear line dividing said front panel into an upper portion and a lower portion, and

ii. a pair of spaced apart tear lines extending downwardly from said transverse tear line to the edge of the lower portion of said front panel;

b. a fold-out panel foldably connected to said bottom panel and disposed behind said front panel the terminal edge of said fold-out panel disposed adjacent to said transverse tear line;

c. means for adhesively securing at least a part of the lower portion of said front panel to said fold-out panel;

d. a sheet of flexible material extending peripherally around the interior of said box from the inner surface of said fold-out panel to the inner surface of said front panel;

e. means for securing said sheet to said fold-out panel; and

f. means for securing said sheet to said front panel only at a location between said transverse tear line and the fold line which connects said front panel to the adjacent panel, the terminal portion of said sheet which extends beyond said location of securement being disposed between said front panel and said fold-out panel whereby said terminal portion of said sheet provides a dust cover when said box is opened.

3,900,159

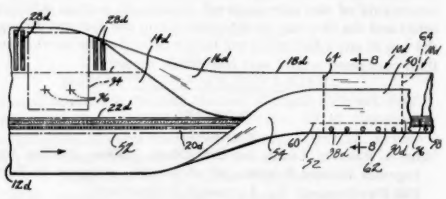
CONTINUOUS FORM ENVELOPES

Wilfred H. Gendron, Wilbraham, Mass., assignor to United States Envelope Company, Springfield, Mass.

Filed Nov. 8, 1968, Ser. No. 774,261

Int. Cl. B65d *27/10*

U.S. Cl. 229—69 **5 Claims**



1. An assembly of series connected separable envelopes comprising an elongated web of sheet material folded onto itself and having at least two plies including a lower ply and at least one upper ply connected to one side edge of said lower ply along a longitudinally extending fold line and overlying an associated portion of said lower ply, said lower ply having a longitudinally disposed marginal portion transversely extending beyond the free side edge of said one upper ply, means connecting said one upper ply and said lower ply in face-to-face relation along longitudinally spaced transversely extending lines of attachment to form a succession of envelopes each having a pocket including a mouth open at one side thereof and partially defined by said free side edge, a longitudinally spaced series of lines of weakening extending transversely of said plies, each of said envelopes being connected to an adjacent one of said envelopes along one of said transversely extending lines of weakening, at least one generally longitudinally extending line of weakening disposed on said marginal portion transversely spaced from said free side edge and separating a connecting strip from the remainder of said marginal portion, one longitudinally extending line of adhesive disposed on said marginal portion between said line of weakening and said free side edge, another longitudinally extending line of adhesive disposed on said connecting strip, another upper ply connected to the other side edge of said lower ply along another longitudinally extending fold line, said other upper ply overlying at least a portion of said one upper ply, said one line of weakening and said other side edge defining the transverse extent of said connecting strip, a portion of said other ply

overlying said connecting strip and attached in face-to-face relation thereto by said other line of adhesive, said other ply portion forming a part of said connecting strip, and another line of weakening disposed on said other ply and separating the portion of said other ply which forms said connecting strip from the remaining portion of said other ply.

3,900,160

PAPER CURRENCY DISPENSING ENVELOPE

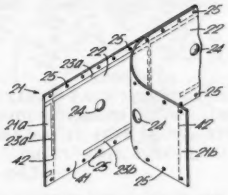
Hideyuki Goto; Shoji Morishita, and Takashi Usami, all of c/o Omron Tateisi Electronics Co., 20, Igadera, Shimokalinji, Nagaoka-cho, Otokuni-gun, Kyoto, Japan

Division of Ser. No. 188,152, June 12, 1971, abandoned. This application June 1, 1973, Ser. No. 366,084

Claims priority, application Japan, Oct. 15, 1970, 45-102786

Int. Cl. B65d *27/04, 27/10*

U.S. Cl. 229—71 **2 Claims**



1. A flat, planar, generally rectangular, paper currency-dispensing envelope defined by a pair of oppositely disposed sheets of pliable material which can be torn asunder to remove the currency therefrom, the mutually opposing faces of which sheets are adhered to one another at points along lines of securement coinciding with the margins of said envelope, there being a plurality of bills of exchange removably disposed in said envelope so as to be coincident as a whole with the plane of said envelope, the edges of said bills are disposed adjacent said lines of securement between said faces, and said lines of securement being substantially coextensive with said bill edges so that said bill is substantially surrounded by lines of securement and is not removable from said envelope without tearing said sheets asunder, there being, however, a section along at least one line of securement at which said faces of said sheets are unadhered and separable from one another so that an opening is formed between said faces of said sheets at said section and said opening being located at one corner of said envelope adjacent corresponding corner edges of said bills and being constructed so that the bill corners are exposed by said opening whereby the type and number of bills of exchange may be verified by counting the number of bill corners thus exposed before tearing the sheets asunder and removing the envelope contents.

3,900,161

WRAPPER FOR BREAD AND THE LIKE

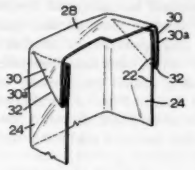
Maurice R. Blackman, 9 Edgar Ave., Toronto, Ontario, Canada (M4W 2B1)

Filed Sept. 20, 1973, Ser. No. 399,070

Int. Cl.[2] B65D *33/00*

U.S. Cl. 229—87 B **8 Claims**

1. A wrapper for bread and the like having a generally square closed end wall configuration in use comprising, a sleeve consisting of a pair of panels disposed in face-to-face relationship and connected to one another at the outermost side edges thereof, said sleeve having an open end and a closed end, said closed end of said sleeve being folded outwardly upon itself about a single fold line disposed adjacent and parallel to said closed end thereof so as to form end wall panel means extending between said fold line and said closed end, and side wall forming panel means extending from said fold line to said open end, said end wall forming panel means having side edges secured with respect to each of said side wall forming panel means only at said outermost side edges thereof



so as to secure said end wall panel means in an outwardly overlapping relationship with respect to said side wall panel means when said sleeve is in a knockeddown configuration.

3,900,162

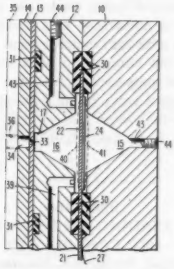
METHOD AND APPARATUS FOR GENERATION OF MULTIPLE UNIFORM FLUID FILAMENTS

Donald E. Titus, Endicott, and Sherman H. M. Tsao, Apalachin, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 10, 1974, Ser. No. 432,260

Int. Cl. B05b *1/08*

U.S. Cl. 239—102 **14 Claims**



1. Apparatus for producing a plurality of parallel streams of fluid droplets comprising:

means providing a cavity for receiving pressurized fluid;

nozzle means along a wall of said cavity means having at least one row of orifices therein;

means for supplying fluid under pressure to said cavity so that said fluid flows through said orifices in parallel streams;

means within said cavity for generating a series of pressure distrubances therein, said generating means including a flexible member and a plurality of independently movable elements cooperably bending said member to produce a said pressure disturbance when moved; and

means for simultaneously and repetitively moving said elements to create a said pressure disturbance along said nozzle row, thereby creating pressure perturbations within said issuing streams.

3,900,163

DISPENSING APPARATUS

Herbert W. Volker, 463 Church St., Kohler, Wis. 53044

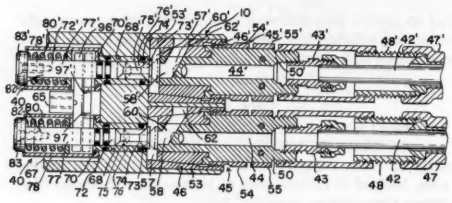
Filed July 29, 1974, Ser. No. 492,544

Int. Cl. B05b *7/04*

U.S. Cl. 239—112 **14 Claims**

1. A device for mixing and dispensing coating material which comprises a body member, means forming a mixing chamber in the body member and a discharge nozzle leading therefrom, said body member having parallel bores extending therethrough, passageways leading from one end of each bore

to said mixing chamber, a flow control valve mounted in said one end of each bore, a flow selector valve adjustably mounted in each said bore in alignment with the flow control valve therein, a pivotally mounted trigger member having a connection with each of said flow control valves and operative in one position thereof to open said control valves so as to allow passage of coating through said passageways to said mixing chamber and operative in another position to close said flow control valves, each said flow selector valve having an axially extending infeed passageway to which an inner supply conduit is attached and a parallel passageway for return flow of material to which an outer conduit is connected which outer conduit encloses said inner supply conduit, each



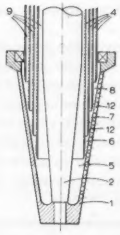
said flow selector valve being disposed in its respective bore so as to provide a relatively small chamber between the innermost end thereof and the confronting innermost end of the associated flow control valve, each said selector valve being formed so that it is adjustable to a position to connect the infeed passageway with said chamber and also adjustable to a position to close the connection with said chamber and to connect the infeed passageway with the return passageway and each flow control valve being formed and disposed in its respective bore so that when said valve is in an open position material will flow from said chamber through said control valve.

3,900,164

MEANS FOR FEEDING FLUID MATERIALS TO A PRILLING BUCKET

Isak Andreas Friestad, Porsgrunn, Norway, assignor to Norsk Hydro A.S., Oslo, Norway

Filed Mar. 5, 1974, Ser. No. 448,387
Claims priority, application Norway, Mar. 8, 1973, 942/73
Int. Cl. B05b *3/08*
U.S. Cl. 239—222 **6 Claims**



1. In a system for feeding liquid material to the orifices of a perforated conical prilling bucket which rotates about a vertical axis to throw said liquid material outwardly through said orifices of the bucket wall to form droplets which are solidified to form prills, the improvement comprising:

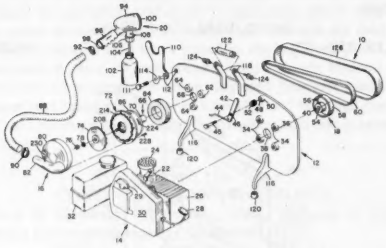
means for introducing said liquid material into said prilling bucket in the form of annular and laminar streams and directing each of said streams to vertically separated orifice row zones in the wall of said prilling bucket, said means comprising a plurality of cylindrical tubes defining therebetween a plurality of annular spaces, said tubes being mounted in a concentrical relationship about the axis of rotation of said prilling bucket, said tubes at their lower ends terminating adjacent said bucket wall along substantially horizontal planes, and dividing said wall into said separate orifice row zones.

3,900,165

HAND CARRIED SPRAYING APPARATUS

James G. Parke, and C. Richard Gerlach, both of San Antonio, Tex., assignors to Micro-Gen Equipment Corporation

Filed Apr. 15, 1974, Ser. No. 460,725
Int. Cl. A01g *25/14*
U.S. Cl. 239—375 **10 Claims**



1. A portable insecticide aerosol generator comprising:

a. a source of air;

b. a source of insecticide;

c. means for pressurizing said source of air to a substantially constant pressure;

e. chamber means remote from said pressurizing means for receiving said substantially constant pressure air, said chamber means being independently movable with respect to said pressurizing means;

f. nozzle means forming a portion of said remote chamber means and in communication therewith; and

g. conduit means connecting said insecticide source to said nozzle means for communication therewith;

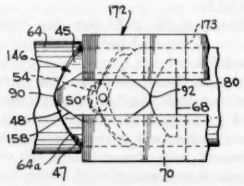
h. said insecticide being drawn into said nozzle means via said conduit means by vacuum force, mixed in said nozzle means remote from said pressurizing means, and dispersed from said nozzle means in a mist created by a turbulence therein to break the insecticide into small particles.

3,900,166

APPARATUS FOR RECIPROCATING A YARN GUIDE

Rolland E. Sartori, Riorges, France, assignor to Ateliers Roannais de Constructions Textiles, Roanne, France

Continuation of Ser. No. 261,362, June 9, 1972, abandoned. This application Dec. 27, 1973, Ser. No. 429,039
Int. Cl. B65h *54/30*
U.S. Cl. 242—43 **6 Claims**



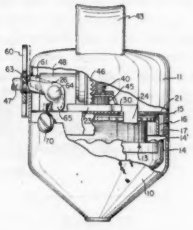
1. In apparatus for reciprocating a yarn guide for supplying yarn to be wound to a bobbin including a cylindrical rotatable

cam having a pair of spiral pilot grooves formed in the periphery thereof, said pilot grooves formed by side walls and joined at opposite ends of said cam to define spaced positions of direction reversal, track means disposed in parallel with said cam, and traveler means adapted to be connected with the yarn guide and slidably received in said track means, said traveler means including an axle carrying a pilot block riding in said pilot grooves, the improvement comprising:

direction reversing guide means disposed at each of said positions of direction reversal, each of said direction reversing guide means including a guide wall superposed and longitudinally spaced from the outer side walls of said pilot grooves at said direction reversal positions;

said traveler means including a shuttle slidable in said track means, said shuttle having rounded ends for abutting said guide wall at a center of impact during direction reversal of said shuttle, each of said direction reversing guide means including a guide member on said rotatable cam opposite and spaced from said guide wall to prevent said pilot block and said axle from impact with the side walls of said pilot grooves during direction reversal of said shuttle.

3,900,167
CLOSED FACE SPINNING REEL
R. Dell Hull, 6101 E. Appache St., Tulsa, Okla. 74101
Filed June 17, 1974, Ser. No. 479,633
Int. Cl.² A01K *89/00, 89/02*
U.S. Cl. 242—84.2 A **6 Claims**



1. In a closed face spinning reel including a cylindrical reel frame body having a transverse circular wall having an opening therein, a spool supported on a hub projecting forwardly of said wall, a main shaft extending axially through the center of said circular wall, a crank drive mechanism mounted in said reel frame for rotating said main shaft, line pickup means carried by the forward end of said main shaft, a front cover means closing off the front face of said reel frame and a rear cover means closing off the rear face of said reel frame, the improvement including:

a. bracket means extending rearwardly from said transverse wall;

b. a hollow externally threaded post means extending radially outwardly of said bracket means;

c. said crank drive mechanism including crank shaft means disposed perpendicular to said main shaft and supported for rotation within said bracket means and within said post means;

d. said crank shaft means projecting laterally outwardly of said cylindrical frame body to accommodate the mounting thereon of a crank handle;

e. a drag brake lever of resilient leaf spring construction pivotably supported on said transverse wall and having a bent end projecting axially through said opening in said wall and engaging a peripheral portion of said spool, the other end of said lever being adapted to be selectively displaced to vary the drag braking pressure applied by said first end to said spool;

f. a flat star wheel directly threaded to said post means for limited travel therealong;

g. a bell crank pivotably mounted in a plane perpendicular to that of said star wheel;

h. the one end of said bell crank engaging said star wheel and the other end engaging said drag brake lever;

i. whereby selective displacement of said star wheel along said post pivots said bell crank to vary the braking pressure applied to said line spool by the brake lever.

5. A closed face spinning reel comprising

a. a central circular reel frame means supporting a line spool, rotatable pickup head, and associated reel control mechanism thereon;

b. said reel frame means having peripheral circumferential flanges projecting axially thereof;

c. locking screws, each threadedly engaged with said reel frame means, having a head portion defining an annular groove at the underside thereof;

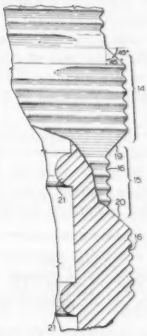
d. cup-shaped front and rear covers having annular flanges of predetermined diameter slightly greater than the diameter of said peripheral reel frame flanges;

e. each of said covers including a pair of semi-circular openings defined by semi-circular shoulders;

f. said openings of said front and rear covers forming completely circular openings surrounded by annular shoulders when said front and rear covers are abutted in edge-to-edge relation;

g. whereby said covers may be locked to said reel frame in edge-to-edge abutment through the cooperation of said shoulders with said annular grooves of said locking screws.

3,900,168
TEXTILE CONE
Arthur C. Hamilton, Weston, Canada, assignor to Texcone Limited, Mississauga, Canada
Filed Nov. 21, 1973, Ser. No. 417,866
Int. Cl.² B65H *75/26, 75/10*
U.S. Cl. 242—118.32 **10 Claims**



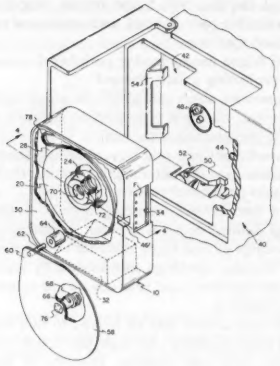
1. A plastic textile cone for winding synthetic yarn, comprising: a hollow frusto-conical body having a non-slip conical peripheral surface tapering from a circular base end to a relatively smaller circular truncated end, said peripheral surface having a surface configuration comprising a plurality of circumscribing ridge sections and groove sections formed alternately thereon, said ridge sections and groove sections being substantially parallel to said base end, and each of said ridge sections and groove sections having a front surface comprising a plurality of circumscribing fine grooves substantially parallel to said base end, whereby said peripheral surface has a frictional yarn-holding characteristic uniform throughout its entire length.

3,900,169

FILM CARTRIDGE

Jeffrey C. Robertson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 30, 1974, Ser. No. 465,454
Int. Cl.[2] G03B 1/04; G11B 15/32
U.S. Cl. 242—194 5 Claims



1. In a cartridge having walls defining a chamber for a supply of strip material, the supply being a roll formed of a plurality of adjacent convolutions of the strip wherein opposite edges of the strip lie substantially in two parallel planes, the improvement comprising:

a restraining member disposed in the chamber substantially parallel to the planes in which the edges of the strip lie, said member being adjacent one of the planes and being movable between (1) a first position wherein the supply is held firmly between said member and one wall of the supply chamber with a force sufficient to hold adjacent convolutions of the strip against relative motion and to prevent rotation of the supply and (2) a second position wherein the supply is released to permit the supply to rotate;

resilient means operatively coupled to said restraining member for urging said member toward its first position; and means coupled with said restraining member and responsive to tension being applied to the strip for moving said restraining member toward its second position.

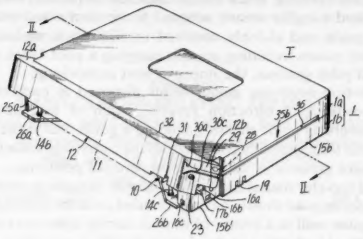
3,900,170

TAPE CASSETTE

Akio Serizawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 372,959, June 25, 1973, abandoned. This application Oct. 4, 1973, Ser. No. 403,431
Claims priority, application Japan, June 29, 1972, 47-76844
Int. Cl.[2] G11B 23/10
U.S. Cl. 242—198 8 Claims

1. A tape cassette comprising a housing of generally rectangular configuration containing a supply of tape and having top and bottom walls and a peripheral wall extending between said top and bottom walls along three of the sides of the latter so as to leave an opening along the fourth side of the housing through which the tape can be withdrawn, a lid pivoted on said housing for movement between a closed position covering said opening and an opened position exposing said opening, and guide means on said bottom wall extending in a direction parallel to said fourth side and on said peripheral wall along at least one of the sides of the housing extending in a direction at right angles to said fourth side for slidably guiding the tape



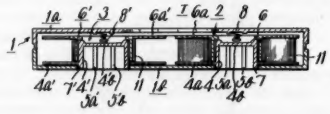
cassette into a cassette holder in either of said directions without requiring the exertion of pressure on said lid.

3,900,171

TAPE CASSETTE

Akio Serizawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 372,959, June 25, 1973, abandoned. This application Oct. 4, 1973, Ser. No. 403,488
Claims priority, application Japan, June 29, 1972, 47-76844
Int. Cl.[2] G11B 23/10
U.S. Cl. 242—198 7 Claims



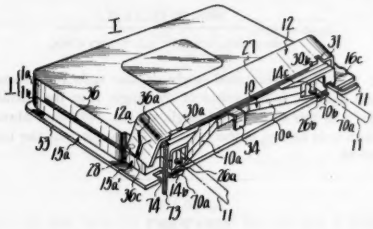
1. A tape cassette comprising a housing of generally rectangular configuration containing reels on which a supply of tape is wound and having top and bottom walls and a peripheral wall extending between said top and bottom walls along three of the sides of the housing so as to have an opening along the fourth side of the housing, said bottom wall having a cutout communicating with said opening and extending along a portion of said fourth side of the housing, means guiding the tape between said reels in a path having a run extending along said opening and across said cutout so that said run of the tape can be engaged through said cutout for withdrawal of the tape through said opening, a lid mounted on said housing and being movable relative thereto between a closed position covering said opening and an opened position exposing said opening, said lid including a front portion which, in said closed position, extends along said opening and has a lower edge portion abutting, at its inner surface, against the adjacent edge of said bottom wall at opposite sides of said cutout, with said front portion of the lid being raised relative to said opening in said opened position of the lid, said front portion of the lid having cutouts in said lower edge portion thereof at spaced apart locations respectively disposed at opposite sides of said cutout in the bottom wall when said lid is in said closed position, and locating elements extending from said edge of the bottom wall at opposite sides of said cutout in the latter and being dimensioned and located to extend through and substantially fill said cutouts, respectively, in said front portion of the lid in said closed position of the latter and by which said housing can be

accurately located without hindering the movement of said lid.

3,900,172
TAPE CASSETTE

Naoki Kamaya, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 31, 1974, Ser. No. 438,447
Claims priority, application Japan, Feb. 1, 1973, 48-14227; Sept. 25, 1973, 48-111572
Int. Cl. G03b *1/04;* **G11b** *15/32, 23/04*
U.S. Cl. 242—198 **7 Claims**

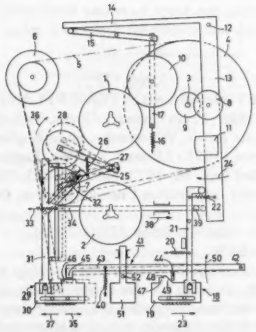


1. A tape cassette comprising:
a. a housing of generally rectangular configuration containing at least one reel for a supply of tape and having top and bottom walls and a peripheral wall extending between said top and bottom walls along the sides of the latter so as to leave an opening along at least a side of the housing through which the tape can be exposed;
b. a lid pivoted on said housing for movement between a closed position covering said opening and an opened position exposing said opening; and
c. means responsive to the position of said lid for preventing rotation of said reel when said lid is in the closed position and for permitting rotation of said reel when said lid is in the opened position.

3,900,173
RECORDING AND/OR PLAYBACK APPARATUS

Manfred Ketzer, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 12, 1972, Ser. No. 271,015
Claims priority, application Austria, July 15, 1971, 6161/71
Int. Cl. G03b *1/04;* **G11b** *15/32*
U.S. Cl. 242—201 **5 Claims**

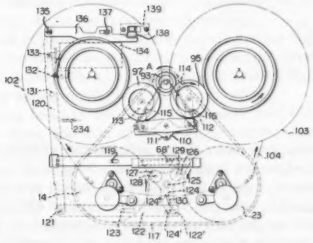


1. In a recording and/or playback apparatus, an operating device locking mechanism comprising:
a first operating device for conditioning the apparatus for normal transport of a record carrier, said device being movable from a non-operative to an operative state;
a second operating device for conditioning the apparatus at least for rewind transport of the record carrier, said device being movable from a non-operative to an operative state;
means responsive to movement of said second operating device to an operative state for cancelling a function for which the apparatus is conditioned by said first operating device only for the time during which said second operating device is in an operative state;
common locking means responsive to the state of said first operating device for locking said first operating device in the operative state, and for locking said second operating device in an operative state upon movement from the non-operative state to an operative state only if said first device is in the non-operative state at a time said movement is initiated; and
means for releasing said common locking means.

3,900,174
AUTOMATIC MAGNETIC TAPE RECORDING AND REPRODUCING DEVICE

Toshio Morimoto, Hirakata, and Yoshiaki Fukunaga, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 286,002, Sept. 5, 1972, abandoned, which is a continuation of Ser. No. 108,142, Jan. 20, 1971, abandoned, which is a continuation of Ser. No. 700,527, Jan. 25, 1968, abandoned. This application Jan. 4, 1974, Ser. No. 430,665
Claims priority, application Japan, May 4, 1967, 42-29040; May 4, 1967, 42-29041
Int. Cl. G11b *15/30*
U.S. Cl. 242—209 **4 Claims**



1. In a magnetic tape recording and reproducing apparatus, comprising first and second reel stands for mounting tape supply and take-up reels, drive means for selectively driving said reel stands in opposite directions of rotation, first and second flywheels, having tape drive capstans mounted thereon, coupled to and rotatably driven by said drive means, control means coupled to said drive means for controlling the direction of rotation of said reel stands and said flywheels, and braking means mounted for engagement with said flywheels to exert a braking force on at least one of said flywheels when the direction of rotation of said flywheels is changed by said control means, said braking means comprising:
a rocker member movably mounted on a base plate of said apparatus;
first and second brake rollers mounted on said rocker member for engagement with said first and second flywheels, respectively;
a brake lever coupled to said control means for movable between first and second positions depending on the direction of rotation of said reel stands and flywheels; and means coupling said brake lever to said rocker member for moving said rocker member between first and second

positions in correspondence with said first and second brake lever positions, wherein

in said first position of said rocker member, said first brake roller engages said first flywheel to apply at least a momentary braking force thereto and said second brake roller is disengaged from said second flywheel, and

in said second position of said rocker member, said second brake roller engages said second flywheel to apply at least a momentary braking force thereto and said first brake roller is disengaged from said first flywheel.

3,900,175

GUIDANCE SYSTEM FOR AN ANTI-AIRCRAFT MISSILE

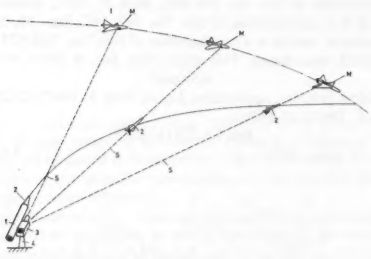
Gunnar Sten Gustav Birger Eckerstrom, Askim, and Sven Willner Eriksson, Karlskoga, both of Sweden, assignors to AB Bofors, Bofors, Sweden

Filed June 19, 1973, Ser. No. 371,387

Claims priority, application Sweden, June 26, 1972, 8398/72

Int. Cl. F42b *15/02*

U.S. Cl. 244—3.13 **2 Claims**



1. In a guidance system for an anti-aircraft missile adapted to be launched from a launching device, comprising a sighting device disposed close to said launching device and having a sight-line movable about an azimuth axis and an elevation axis perpendicular to the azimuth axis and intended to be kept pointing at a target during the guidance of a launched missile towards the target, said launching device being coupled to said sighting device so as to have its launching direction substantially parallel to the direction of said sight-line at the instant of launching the missile; means for determining the deviation of the launched missile from said sight-line in a two-axes orthogonal coordinate system having a first axis and a second axis lying in a plane perpendicular to the sight-line with its origin coinciding with the sight-line and for producing a first deviation signal representing the deviation of the missile from the sight-line in the direction of said first coordinate axis and a second deviation signal representing the deviation of the missile from the sight-line in the direction of said second coordinate axis; and flight control means in said missile responsive to said deviation signals for influencing the direction of flight of the missile in a yaw control plane extending through the longitudinal axis of the missile in response to said first deviation signal and in a pitch control plane extending through the longitudinal axis of the missile perpendicularly to said yaw control plane in respone to said second deviation signal so as to control the missile to fly along said sight-line, said flight control means including attitude sensing means for determining the orientation in space of said yaw and pitch control planes, the improvement comprising that said attitude sensing means include a direction reference gyro mounted in a locked position relative to the missile before the launching of the missile with its reference direction perpendicular to the plane parallel to the elevation axis of the sight-line and to the launching direction of the launching device and adapted to be released in said position relative to the missile at the launching of the missile and subsequently to define a plane perpendicular to its reference direction as said yaw control plane for said flight control means, and that after the launching of the missile said coordinate system is rotated about the sight-line through an angle ϕ in response to the movements of the sight-line of the sighting device, the value of said angle ϕ corresponding at least approximately to the expression

$$\tan\phi = \frac{\sin\gamma_o \sin(\chi - \chi_o)}{\sin\gamma \sin\gamma_o \cos(\chi - \chi_o) + \cos\gamma \cos\gamma_o}$$

where χ is the directional angle of the sight-line about its azimuth axis, χ_o is the value of the angle λ at the instant of launch, γ is the directional angle of the sight-line about its elevation axis and γ_o is the value of the angle γ at the instant of launch.

3,900,176

AIRCRAFT

Robert A. Everett, 704 S. 142 E. Ave., Tulsa, Okla. 74108

Continuation-in-part of Ser. No. 365,555, May 31, 1973, abandoned. This application Jan. 31, 1974, Ser. No. 438,233

Int. Cl. B64c *27/30*

U.S. Cl. 244—6 **7 Claims**

1. An aircraft with fixed wings,

with rotors mounted to rotate around a vertical axis attached to the aircraft,

a flap structure with a horizontal axis and attached to the surface of each rotor blade,

an air scoop formed along the trailing edge of each flap arranged to face rearwardly of the direction of the rotor blade movement,

a means arranged to permit each flap to pivot on its horizontal axis into a vertical position against a stop, when air currents contact the air scoop,

whereby the underside of the flap is exposed to the pressure from the air currents,

thereby forcing the rotor to rotate horizontally around its vertical axis and create lift force as it spins.

3,900,177

JET PROPULSION POWERPLANT

Peter Henry Calder; Prem Chandra Gupta, both of Bristol, and William James Lewis, Winscombe, all of England, assignors to Rolls-Royce (1971) Limited, London, England

Filed Oct. 10, 1973, Ser. No. 405,170

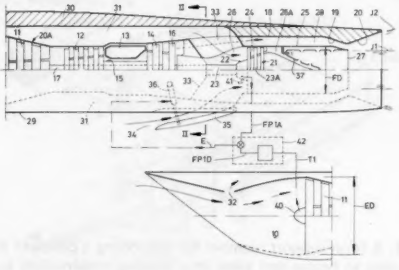
Claims priority, application United Kingdom, Oct. 14, 1972, 47500/72

Int. Cl. B64d *27/20, 29/04*

U.S. Cl. 244—53 R **4 Claims**

1. A jet propulsion powerplant comprising a gas turbine turbojet engine, a casing for the engine having a substantially circular cross-section, a nacelle shaped for supersonic flight speeds in which the engine in its casing is located, the nacelle having a substantially square cross-section and defining with the casing a duct which thereby has an exterior periphery which is substantially square in cross-section and an interior

periphery which is substantially circular in cross-section, the nacelle having an inlet capable of receiving ambient air at flight speeds up to supersonic speeds and being arranged for supplying air to both said engine and said duct, characterised by a fan located within said nacelle downstream of the turbojet engine and connected to the turbojet engine thereby to be



driven by the turbojet engine, said fan having a rotational diameter less than the greatest rotational diameter of the turbojet engine said duct being connected to supply air from said inlet around the exterior of said casing to said fan, and means positioned substantially downstream of said turbojet for introducing additional air into said fan thereby to increase the air flow through said fan.

3,900,178

SUPERSONIC AIRCRAFT WITH A DELTA WING

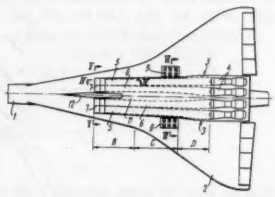
Andrei NikolaevichLeninsky prospekt, 14 Tupolev; Alexei Andreevich Tupolev, ulitsa Stanislavskogo, 15, kv.25; Kurt Vladimirovich Minkner, Leninsky prospekt, 30, kv.159; Alexandr Romanovich Bonin, naberezhnaya M. Gorkogo, 28/30, kv.33; Georgy Alexeevich Cheremukhin; Valentin Ivanovich Bliznjuk, all of Moscow; Alexandr Leonidovich Pukhov, Zhukovsky Moskovskoi Oblasti; Georgy Petrovich Svischev; Georgy Sergeevich Bjushgens, Moscow; Alexandr Vasilievich Nikolaev, and Vitaly Georgievich Mikeladze, Zhukovsky Moskovskoi Oblasti, all of U.S.S.R.

Continuation of Ser. No. 18,048, March 10, 1970, abandoned. This application Apr. 10, 1972, Ser. No. 242,717

Claims priority, application U.S.S.R., Mar. 10, 1969, 1348852

Int. Cl. B64d *27/00*

U.S. Cl. 244—55 **8 Claims**



1. A supersonic aircraft provided with a thin delta wing, comprising a pair of nacelles each of which nacelles accommodates two engines and two autonomous air intake ducts for servicing the engines, said necelles being mounted under the wing near the longitudinal axis of the aircraft and arranged symmetrically relative to the longitudinal axis; the front portion of one of the air intake ducts disposed in one of said nacelles, which is the nearest to the longitudinal axis, being spaced from a similar portion of one of the air intake ducts disposed in the other nacelle, which is the nearest to the longitudinal axis, over a minimal distance equalling **1.35–1.70** of the width of the duct each said autonomous air intake duct including turnable panels, in which the front portion of the air intake duct which is nearest to the longitudinal axis of the aircraft in each of said nacelles, including the portion accommodating said turnable panels, is rectilinear in plan, and is disposed at an angle of 1.0°–1.5° relative to the longitudinal axis, with the angle peak facing the nose of said aircraft.

3,900,179

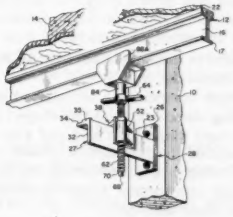
COLUMN ROLL OUT SUPPORT

Richard C. Mocny, and Francis B. Mueller, both of Downers Grove, Ill., assignors to Waco Scaffold & Shoring Co., Schiller Park, Ill.

Continuation-in-part of Ser. No. 322,969, Jan. 12, 1973, Pat. No. 3,815,858. This application June 5, 1974, Ser. No. 476,406

Int. Cl.² A47F *5/10;* **A47H** *33/00;* **E04G** *17/16*

U.S. Cl. 248—287 **11 Claims**



1. In a device of the class described for shoring and rolling out formwork intact having spaced parallel beams for reuse in pouring concrete floor slabs, the combination of two support means laterally and directionally adjustable on adjacent sides of spaced structural columns comprising:

lateral adjustment extension means having opposing bases mounted on the structural columns and carrying horizontal arms defining vertical weight-bearing flanges extending approximately towards each other,

shoring bracket means resting against said vertical flanges to form one side of a clamping member and adjustably movable towards and away from each other on said arms and including second clamping members for holding them in a predetermined spaced relation related to said parallel beams vertically disposed tubular elements spaced the same distance as said beams,

screw lift means including screws supported in said tubular elements and including nut means threaded thereon for raising and lowering said screws when the screws are rotated,

roller fixture means swivelly supported with respect to and on the upper end of the screws carrying horizontally disposed rollers to engage said parallel beams in roll-out relationship,

guide flange means disposed square to said rollers and swivelly carried by said screw to engage said beams in laterally and longitudinally ruiding relationship for confining the rollers square to a predetermined roll-out path for the formwork.

3,900,180

SUPER-SAFE TOWEL HOOK

John L. McPhee, Burlingame, Calif., assignor to Aluminum Plumbing Fixture Corporation, Burlingame, Calif.

Filed Apr. 10, 1974, Ser. No. 459,556

Int. Cl.² F16B *45/00*

U.S. Cl. 248—288 **1 Claim**

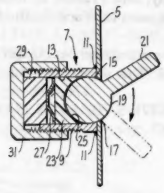
1. A safety hook for towels and the like for use in the prevention of suicide by a person confined within a space at least part of which is defined by a wall, said safety hook being

incapable of resisting a substantial force either from horizontal or vertical forces, said safety hook comprising in combination:

a. an enclosure defining said space and including at least one wall, said wall having a first surface exposed to the interior of said enclosure and a second surface exposed to the exterior of said enclosure,-.

b. a hole in said wall,

c. a nipple extending outwardly from said hole on the second surface of said wall,



d. a constriction in said nipple adjacent to the point where the nipple enters the wall,

e. a towel holder comprising a ball-shaped member with a rod extending therefrom, said ball-shaped member being inserted in said nipple and said rod extending through said hole beyond the first surface of said wall,

f. said nipple being of a size to permit the entrance of said ball and said constriction being so small that the ball cannot pass there through,

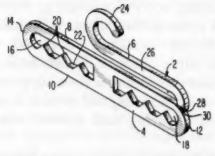
g. means mounted behind said second surface within said nipple whereby tension on said ball can be adjusted.

3,900,181

DUAL PURPOSE SOCK HOLDER

Nicholas James Pitanis, 1819 Carolyn Dr., Lexington, Ky. 40502

Filed Jan. 15, 1974, Ser. No. 433,833
Int. Cl. A44b *17/00*; **A47j** *51/08*
U.S. Cl. 248—340 **8 Claims**



1. A dual purpose holder for a pair of hose by which the hose may be hung for sales display purposes and paired together for laundering purposes which comprises:

a retainer member,

a hanger member integral therewith,

said retainer member being planar in configuration,

two separate transverse openings in said retainer member, each opening being of such size that one hose of a pair may be draped therethrough and retained therein during a normal laundering of the hose,

said hanger member being a sinuous rod having a C-shaped free end portion held spaced from said retainer member at one side thereof by an elongated leg portion,

said hanger member being coplanar with said retainer member and attached thereto by said leg portion,

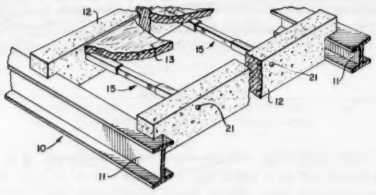
said attachment being defined by a demarcation along which the hanger member may be separated from the retainer member by severance force.

3,900,182

CONSTRUCTION FORM SUPPORT MEMBER

Herbert M. Berman, and Ira Hooper, both of New York, N.Y., assignors to Composite Construction Systems, Inc., New York, N.Y.

Filed Dec. 8, 1972, Ser. No. 313,488
Int. Cl.² E04G *17/00*, *25/04*
U.S. Cl. 249—24 **4 Claims**



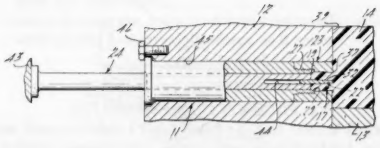
1. A form support member for supporting a concrete form relative to beams and joists in a building construction to receive concrete thereover comprising, longitudinally extensible and retractable support means including a central spanning member and telescoping end parts on opposing ends of said spanning member, each of said telescoping end parts including a support pin member extending outwardly therefrom to be received in a supporting relationship in openings in adjacent beams or joists to support a molding form, and means to provide movement of the telescoping end parts in a vertical direction relative to said support pin members to effect a contacting relationship with a molding form and a retracted relationship with said form, said vertical movement of said end parts to a contacting relationship with said form effecting a frictional bond between said spanning member and said telescoping end parts to secure said end parts against longitudinal movement when said support pin members are positioned in said openings, said vertical movement to a retracted relationship permitting easy withdrawal of said pin members from said openings and removal of the form support member.

3,900,183

DIE ATTACHMENT FOR FORMING SPLIT TYPE FASTENERS ON MOLDED PARTS

Maynard Wallace, 38172 Seaway Dr., Mt. Clemens, Mich. 48073

Filed Mar. 5, 1974, Ser. No. 448,190
Int. Cl.² B29C *7/00*, *1/06*
U.S. Cl. 249—68 **7 Claims**



1. In combination with die parts defining a die cavity, a die attachment for forming a split type fastener on a molded part, comprising a sleeve having a bore and an inner end facing the die cavity, a forming wedge carried by the inner end of said sleeve, a cap mounted on the inner end of said sleeve and holding said forming wedge in place, said cap having a bore for forming the outer surface of said fastener, said forming wedge extending into said cap bore for forming the slot of said fastener, and an ejector pin slidably mounted in said sleeve and movable between an outer position in which its end coacts with the surfaces of the cap bore, sleeve end and forming wedge to form a cavity for molding the fastener, and an inner position in which it ejects the molded fastener from the bore,

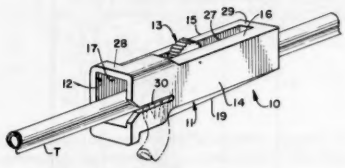
the ejector pin having a slot for accommodating said forming wedge.

3,900,184

ROLLER CLAMP FOR TUBING

George K. Burke; Kenneth Raines, and Robert J. Le Fevre, all of Bethlehem, Pa., assignors to Burron Medical Products, Inc., Bethlehem, Pa.

Filed Dec. 13, 1973, Ser. No. 424,323
Int. Cl.[2] F16K 7/06
U.S. Cl. 251—6 12 Claims



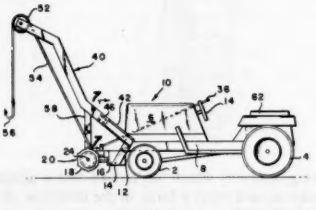
1. A roller clamp for tubing, comprising an elongate tubular body having an axially extending opening therethrough, a ramp at one side of the opening, said ramp having an elongate, axially extending channel therein of increasing depth toward one end thereof, said body having a runway in an inner bottom surface thereof extending longitudinally of the body in parallel relationship to said ramp, and a roller mounted in said axially extending opening for rolling movement therealong, the roller comprising a circular finger engaging portion having opposite faces and a peripheral finger engaging portion accessible exteriorly of the body for manually rolling the roller axially of the body, said peripheral portion of said finger engaging portion supported on said runway for rolling movement along said runway, and a tubing engaging portion extending coaxially from one face of the finger engaging portion, said tubing engaging portion being of reduced diameter relative to the finger engaging portion and having a peripheral outer surface and projecting transversely across the ramp and channel for clamping a length of flexible tubing between the peripheral outer surface of the tubing engaging portion and the ramp and between a side wall of the body and said one face of the finger engaging portion to deform a portion of the tubing into the channel and thus control flow through the tubing.

3,900,185

HOIST CONVERSION UNIT FOR SMALL TRACTORS

John F. Burr, 32 N. Kanawha St., Buckhannon, W. Va. 26201

Division of Ser. No. 57,941, July 24, 1970. This application Feb. 17, 1972, Ser. No. 226,578
Int. Cl. B66c 23/60
U.S. Cl. 254—139.1 2 Claims



1. In combination with a two wheeled, self propelled tractor having an internal combustion engine and a front accessable power takeoff assembly drivingly engaged to said engine; a power takeoff driven hoist conversion unit mounted on and drivingly connected to said front accessable power takeoff assembly, said unit comprising a gear case; a tubular extension interposed between said gear case and said front accessable power takeoff assembly, of said tractor, a power driven shaft extending horizontally from said gear case to either side thereof; a reeling drum mounted on one end of said shaft; a toothed ratchet wheel mounted on the other end of the shaft; pawl means mounted on said tubular housing and releasably engaging said toothed ratchet wheel to prevent its rotation in one direction only; a tubular wheel supported frame extension affixed to said gear case and extending horizontally forwardly therefrom; a boom extending at an angle forwardly and upwardly over said gear case and said wheel supported frame extension, the lower terminal end of said boom including connection means connecting said lower end to the fore part of the tractor adjacent said front accessable power takeoff assembly; and a frame stabilizing means connected to said boom adjacent its upper terminal end and having diverging, ground contacting legs extending downwardly and forwardly of said tubular, wheel supported frame extension; a Pulley rotatably journaled in the upper terminal end of said boom; cable means trained over said Pulley and wrapped on said reeling drum; a brace means having its lower end bearing upon said gear case and its upper end attached to said boom and operator means for operating said pawl extending rearwardly of said tractor for operation by the tractor operation.

3,900,186

MAGNETIC CELL STIRRER

John Thomas Balas, Vineland, N.J., assignor to Wheaton Industries, Millville, N.J.

Division of Ser. No. 379,081, July 13, 1973, Pat. No. 3,854,704. This application Sept. 12, 1974, Ser. No. 505,226
Int. Cl.[2] B01F 13/08, 7/30
U.S. Cl. 259—21 2 Claims

1. For use with a container for stirring cells and the like, said container including a bottom, a wall upstanding from said bottom, and an opening at the top, a magnetic flexible stirrer comprising:

a. a closure for said opening with a central vertical passage and proportioned for a tight fitting relationship with said opening, said passage being offset at an angle with respect to the vertical axis of the container and having a rigid tube received in said passage and a rigid suspension member having its upper end connected to the rigid tube and its lower end to a flexible shaft, said connection of the suspension member to the rigid tube lying in the vertical axis of the container whereby liquid may be introduced into said container through said rigid tube;

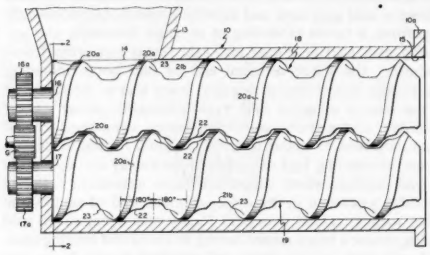
b. a coated magnet rigidly mounted on said flexible shaft at the lower end thereof and closely adjacent to the bottom of said container when the stirrer is assembled therewith, whereby as said magnet is rotated by magnetic operating mechanism the shaft flexes into an arcuate configuration and moves upwardly and outwardly relative to said bottom by the centrifugal force generated by such rotation causing the said flexure.

3,900,187

CONTINUOUS MIXING AND/OR KNEADING MACHINE WITH CO-WIPING SINGLE LEAD SCREWS

Bernard A. Loomans, Saginaw, Mich., assignor to Baker Perkins, Inc., Saginaw, Mich.

Filed Oct. 29, 1973, Ser. No. 410,352
Int. Cl. B29b 1/10
U.S. Cl. 259—192 9 Claims



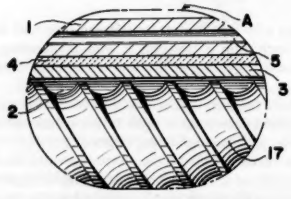
1. In kneading and like machines: a barrel leading in a downstream direction from inlet means to outlet means provided therein; at least a pair of substantially axially parallel shafts extending in said barrel; means for revolving said shafts at substantially the same speed in the same direction of rotation; single-lead, co-wiping, mating, screw portions incorporated with each shaft which in axial cross-section for substantially 180° of screw extent provide a sloping profile from a land section of maximum profile radial extent which wipes said barrel to a portion of minimum profile radial extent; each said sloping profile being interrupted by a radially projecting hump; said land and hump extending continuously helically on each screw portion for the 180° of screw extent.

3,900,188

SCREW EXTRUDER HOUSING WITH A WEAR-RESISTANT LINING

Wilhelm Seufert, Korntal, Germany, assignor to Werner & Pfleiderer, Stuttgart-Feuerbach, Germany

Filed Nov. 13, 1973, Ser. No. 415,295
Claims priority, application Germany, Nov. 18, 1972, 2256671
Int. Cl. B29b 1/10
U.S. Cl. 259—192 5 Claims



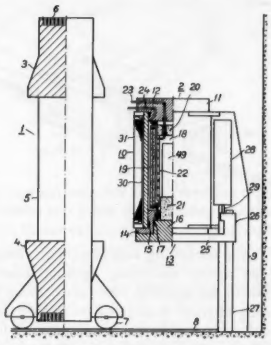
1. A screw extruder comprising in combination:
an elongate housing including a lengthwise extending space;
a sleeve made of a wear-resistant material inserted into said space, the inner peripheral outline of the housing being larger than the outer peripheral outline of the sleeve thereby defining within the housing a space intermediate the inside of the housing and the outside of the sleeve; and
a hardened filler material filling said intermediate space, said filler having a melting point lower than the materials of which the housing and the sleeve are made.

3,900,189

EQUIPMENT FOR TREATING MATERIALS AT HIGH TEMPERATURE AND AT HIGH PRESSURE

Staffan Elmgren, and Lennart Svensson, both of Helsingborg, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed July 16, 1974, Ser. No. 488,991
Claims priority, application Sweden, May 7, 1974, 7406059
Int. Cl.[2] C21D 1/00
U.S. Cl. 266—5 E 6 Claims



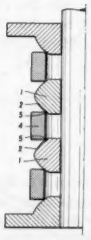
1. Equipment for treating material at high temperature and high pressure comprising a high pressure cylinder which is built up from a tube and a prestressed force-absorbing wire or strip sheath, wound around said tube, end closures projecting into the cylinder and means for taking up forces acting on the end closures, the cylinder is provided with cooling channels in a tubular layer in heat-exchange contact on at least one side with a part of the strip sheath and located at a substantial distance inwardly from the outside of the strip sheath.

3,900,190

SPRING ASSEMBLY

Maximilian Russold; Raimund Scheck, and Heribert Sidan, all of Judenburg, Austria, assignors to Steirische Gusstahlwerke Aktiengesellschaft, Vienna, Austria

Filed Sept. 13, 1973, Ser. No. 396,739
Int. Cl. F16f 3/06
U.S. Cl. 267—9 B 8 Claims

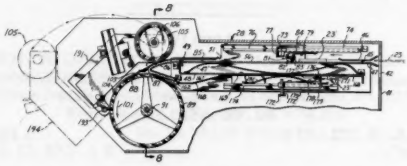


1. A spring assembly which has an axis and is adapted resiliently to take up and exert a force in the direction of said axis and comprises resilient rings which are axially stacked in alternation with rigid rings, said rigid rings being formed on the outside with peripheral sliding surfaces which have angled generatrices having different inclinations to said axis, said resilient rings surrounding said sliding surfaces and bearing thereon in line contact therewith.

3,900,191
CARD ADVANCING AND FUNCTION PERFORMING METHODS AND APPARATUS

Dwight G. Westover, Sierra Madre, and Frederic F. Grant, Bellflower, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Nov. 30, 1973, Ser. No. 420,738
Int. Cl. B65h 5/06, 29/22
U.S. Cl. 271—3 17 Claims

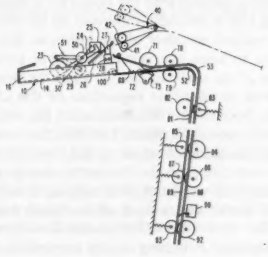


1. In a method of performing a function relative to a card, the improvement comprising in combination the steps of:
placing said card in a first region;
advancing said card from said first region by way of a first path to a second region, whereby a first edge portion of the card leads an opposite second edge portion of the card;
performing said function relative to said card in said second region;
providing a second path different from said first path and leading from said second region to said first region, and locating said second path between said first path and said second region;
making said second edge portion lead said first edge portion of the card;
depressing said leading second edge portion into said second path; and
returning said card from said second region to said first region by way of said second path different from said first path with said second edge portion continuing to lead said first edge portion of the card.

3,900,192
SHEET FEEDING APPARATUS

David K. Gibson, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,483
Int. Cl.[2] B65H 3/06, 31/26
U.S. Cl. 271—3.1 14 Claims



1. A sheet feed apparatus for sequentially feeding each sheet from a stack of sheets located in a storage bin or the like to a predetermined position within a predetermined time period irrespective of the dimension of each sheet in the feed direction or its location in the feed direction within the storage bin including:
means to advance a sheet from the storage bin in the feed direction;
first activating means to activate said advancing means at the start of a sheet advance cycle if a sheet is not at a first position;
first inactivating means to inactivate said advancing means when the sheet is advanced to the first position by said advancing means, said first inactivating means preventing activation of said advancing means by said first activating means if the sheet is at the first position at the start of the sheet advance cycle;
and second activating means to activate said advancing means a constant predetermined period of time after the start of the sheet advance cycle and greater than the period of time for said advancing means to advance a sheet of minimum dimension in the feed direction to the first position from its most remote position in the storage bin to advance the sheet from the first position toward the predetermined position irrespective of whether said first activating means activated said advancing means at the start of the sheet advance cycle.

8. An arrangement for controlling the position of an edge of a sheet in a storage bin or the like relative to a predetermined path along which the sheet travels into the storage bin including:
first means to advance the sheet into the storage bin along the predetermined path;
abutment means in the storage bin disposed at an oblique angle to the predetermined path for the sole engagement by the leading entry edge of the sheet in its travel along the predetermined path into the storage bin;
means to cooperate with each sheet as it travels through the storage bin and strikes said abutment means to control the position of the sheet relative to said abutment means so that the leading entry edge of the sheet remains against said abutment means whereby the trailing entry edge of the sheet is at an oblique angle to the predetermined path; and second means to advance each of the sheets in the storage bin out of the storage bin in a direction away from said abutment means and substantially parallel to the predetermined path to cause each of the sheets to remain at its angled relation to the predetermined path.

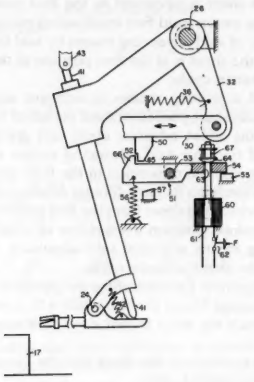
3,900,193
TAKE-OFF GRIPPERS IN PRINTING PRESSES

Franz Theisz, Munich; Max Pollner, Schleissheim, and Roland Holl, Weiterstadt, all of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed Mar. 6, 1974, Ser. No. 448,629
Claims priority, application Germany, Mar. 9, 1973, 2311633
Int. Cl. B65h 29/10
U.S. Cl. 271—85 3 Claims

1. In a sheet delivery mechanism for a printing press having a drive and a conveyor for conveying sheets individually in spaced relation, means defining a pile of sheets at the end of the conveyor, a take-off mechanism comprising an L-shaped take-off arm having a horizontal member and a vertical member, the horizontal member having a take-off gripper at its end and the vertical member being pendulously pivoted for horizontal swinging movement of the gripper between an advanced position and a retracted position, a reciprocating push rod coupled to the vertical leg at one end and having a cam follower at the other, a cycling cam coupled to the drive for causing the push rod to positively retract the arm and gripper, a return spring coupled to the arm for impositively advancing the arm and gripper while maintaining the cam follower seated against the cam thereby to swing the take-off arm so that the gripper thereon removes sheets from the conveyor and deposits them one by one on the pile, a stop coupled to the push rod for reciprocating movement therewith, a latch arranged adjacent the path of movement of the stop and mounted for movement between a latching position and a released position, and

means for temporarily holding the latch in latching position so that upon movement of the push rod by the cam to retracted position the latch captively engages the stop so that the rod, arm and gripper are thereafter held in retracted position accompanied by stressing of the return spring and separation of the cam follower from the cam so that the take-off member is disabled in a position retracted away from the pile and out of the way of oncoming sheets on the conveyor.



3,900,194

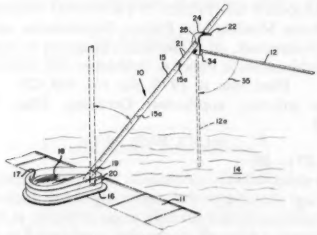
JUMPING STAND WITH PIVOTALLY MOUNTED HORIZONTAL BAR

Frederick Alfonso Ward, 1750 Stokes St., No. 168, San Jose, Calif. 95126, and Leslie Augustus Harvey, 8531 Victory Rd., La Mesa, Calif. 92041

Filed Aug. 15, 1974, Ser. No. 497,683

Int. Cl.[2] A63B *69/00*

U.S. Cl. 272—1 B **3 Claims**



1. A jumping stand comprising the combination of:

a base, said base including weight bearing means and also including a recess extending generally in the vertical direction;

an elongated pole having one end adapted to fit within said base recess for extension of the other end upward from the base;

a clamp adapted for attachment to the pole, said clamp comprising an elongated spring-like flat member having spaced holes therethrough slightly larger than the cross-section of said pole whereby with pressure said flat member can be bent and said pole passed through both holes and with the release of the bending pressure said flat member will grip the pole, said flat member also including an opening for receiving a bolt;

an elongated bar, said bar including an opening near one end for receiving a bolt;

means for mounting the elongated bar on the clamp including a bolt fastener passing through the flat member bolt opening and the elongated bar bolt opening;

said clamp also including a ledge spaced from the flat member bolt opening on which the bar rests when in the generally horizontal attitude, said bar being so mounted on said ledge whereby with lateral pressure the bar will move off the ledge and pivot downwardly out of the horizontal position.

3,900,195

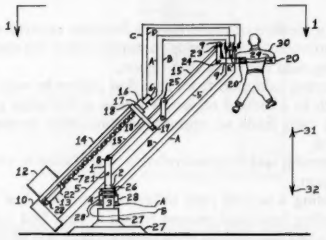
GRAVITY SIMULATOR AND EXERCIZING DEVICE

James N. Preston, 1633 W. Campbell, Phoenix, Ariz. 85015

Filed June 17, 1974, Ser. No. 480,234

Int. Cl.[2] A63B *23/04*

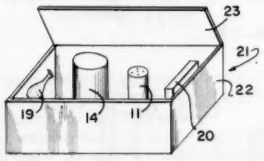
U.S. Cl. 272—57 R **1 Claim**



1. A gravity simulator and exercising device comprising: a pedestal on which a boom is pivotally-mounted through support means so as to rotate 360° in a circle around a vertical axis of the pedestal and so as to swing for a limited distance in vertical planes around a horizontal axis; the boom extending for a distance on either side of the support means; an electrically-moveable counterweight moveably-mounted to the boom so that the counterweight is longitudinally-moveable to any position along the length of the boom that extends between the support means and one end of the boom; pivoting around a horizontal axis perpendicular to the line of the boom, a vertical member pivotally-mounted at one end to the opposite exercise end of the boom; a horizontal member being attached at one end to the vertical member therefrom extending for a horizontal distance beyond the end of the boom in a direction parallel to the vertical plane in which the boom swings; at a vertical distance from the boom, a levelling rod pivotally-fastened at one end to the support means and therefrom extending parallel with the boom for a distance to where the levelling rod is pivotally-mounted on its other end to one end of the vertical member of the boom so that the levelling rod operates to keep the vertical member parallel with the vertical axis of the pedestal and to keep the horizontal member horizontal at all times regardless of the changes in the angles of the boom above the horizontal; the invention including electrically-powered means to move the counterweight in either longitudinal direction along the boom so as to provide any person exercizing on the horizontal member of the boom with any degree of weightlessness ranging from one gravity to zero gravity above the surface of the earth while he or she moves in the vertical and horizontal directions around the pedestal; electrical switching means located on the horizontal member of the device to electrically-connect the electrically-powered means with any source of electricity to provide any person utilizing the device with means to electrically-activate the electrically-powered means so as to electrically-control his or her weightlessness by controlling the position of the counterweight on the opposite end of the boom and then to electrically-disconnect the electrically-powered means at his or her option; fastened to the horizontal member, safety belt means

operating to restrain the body of any person utilizing the device from falling any substantial distance from the horizontal member at altitudes above the surface on which the exercizing device sits; the adjustable counterweight of the device thereby operating to provide any occupant with total and near-total weightlessness so as to enable him or her to leap to great heights in the vertical direction and to great lengths in horizontal directions while exercizing along the circular exercise path around the vertical axis of the pedestal of the device.

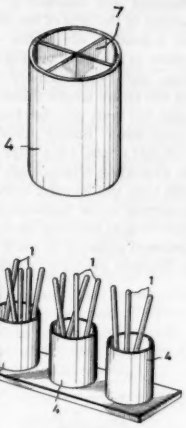
3,900,196
SOUND EFFECT TOY GAME COMBINATION
Thomas John Suttner, 1605 28th Ave. E., Palmetto, Fla. 33561
Filed May 29, 1974, Ser. No. 474,201
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—1 R **1 Claim**



1. In a sound effect toy game combination, a recording unit, means for permitting a person to make various sounds, means for super-imposing the sounds produced on the recording unit, and wherein the sounds that are produced are realistic and life-like, said means comprising a salt shaker having grains of material therein, a can having small elements positioned therein, a strip of sand paper, a piece of glass, a balloon and straws; a pre-recorded record having blank spaces therein, and a record player for reproducing the sounds on the record.

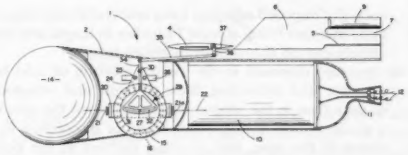
3,900,197
STICK GAME SET
Mitsuo Inose, Sendai, Japan, assignor to Japan Patent Center Inc., Tokyo, Japan
Filed June 27, 1974, Ser. No. 483,849
Claims priority, application Japan, June 27, 1973, 48-71743
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—1 R **1 Claim**

1. A game comprising a plurality of elongated cylindrical-shaped stick members that have indicia imprinted on the cross-sectional area of one end portion, and hollow cylindrical-shaped cup means having an open top and a closed bottom, said cup means having elongated planar members mounted therein to structurally divide said cup means into a plurality of compartments, each of said compartments adapted to receive a selective number of said stick members, each of said stick members being selectively distributed to said cup means and being inserted therein with said indicia end



being placed in a hidden position within the interior of said cup means during the playing of the game.

3,900,198
EXPENDABLE SELF-POWERED TARGET WITH STABILIZING CONTROL
Jack S. Conner, Topanga, Calif., assignor to Northrop Corporation, Los Angeles, Calif.
Filed July 16, 1973, Ser. No. 379,415
Int. Cl. F41j *9/08*
U.S. Cl. 273—105.4 **6 Claims**



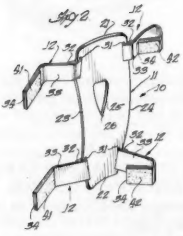
1. An airborne target comprising a body, a thrust motor in said body, means for launching said target into flight and starting said motor, radar reflecting means in said body, a gyro rotor, means for spinning said rotor, a movable direction control member on said target for controlling the course heading of said target, and means responsive to gyro precession for deflecting said direction control member in a turn-nulling direction, said latter means including a rotor-driven element movable solely and directly by the rotational energy of said rotor, said rotor-driven element being brought into direct physical mechanical contact with a spinning portion of said rotor by precession due to heading change of said target.

3,900,199
GOLF SWING TRAINING BRACE
Hugh K. McGonagle, 1250 El Camino Real, Apt. 211, Millbrae, Calif. 94030
Filed Feb. 27, 1974, Ser. No. 446,135
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—189 A **1 Claim**

1. A golf swing training brace device intended for use by golfers for discipline and training for playing the game of golf, the device being directed to retention of the arm of the golfer

in a straight, unbent line during the full golf swing, the device comprising:

a latitudinally elongated body member formed of substantially flat material and adapted to extend length-wise along the outside of the arm of the user across the elbow thereof from a position above the elbow to a position below the elbow to prevent bending of the elbow during the golf swing, said body member being curved transversely along the entire length thereof to conform to the arm of the user, the body member being of a substantially oblong configuration having confronting oppositely slightly curved side edges, a top edge, and a bottom edge, the top edge extending substantially parallel to the bottom edge with both the top and bottom edges extending substantially normal to the latitudinal access of said body member, a pair of slots disposed inwardly of said top edge and a slot disposed adjacent to each side edge, a second pair of slots disposed inwardly of said bottom edge with each slot disposed adjacent to an associated side edge, the body member being at least 12 inches in length and transversely curved throughout its entire length;



an aperture disposed in the central portion of said body member and extending there-through and adapted to receive therein the elbow of the user when the arm is in a straight position to prevent injury or discomfort to the elbow of the user, said aperture defined in the central portion of said body member and being of a generally triangular configuration disposed symmetrically along the latitudinal access of said body member with the apex portion thereof lying substantially on said latitudinal access and pointing in the direction of the bottom edge of said body member; and

strap means affixed to said body member and extending outwardly from opposite sides thereof and adapted to secure the opposite ends of said body member, respectively, about the arm of the user above and below the elbow joint of the arm.

3,900,200

SCUFF RESISTANT SLIDING MEMBER

Yoshikatsu Nakamura, Yokohama, Japan, assignor to Nippon Piston Ring Co. Ltd., Tokyo, Japan

Filed Dec. 4, 1972, Ser. No. 311,618

Claims priority, application Japan, Dec. 4, 1971, 46-97590

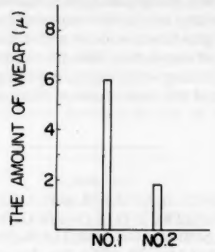
Int. Cl. B05b *7/14, 5/00*

U.S. Cl. 277—235 A **2 Claims**

1. A piston ring having a high scuffing and abrasion resistant sliding surface layer, saic piston ring comprising:

a cast iron body and

a hot metal sprayed Fe_3O_4 particle layer on the sliding surface of the cast iron base body, said hot metal sprayed



Fe_3O_4 layer having an Hv (30) hardness of approximately 700 and being of approximately 0.1 mm in thickness.

3,900,201

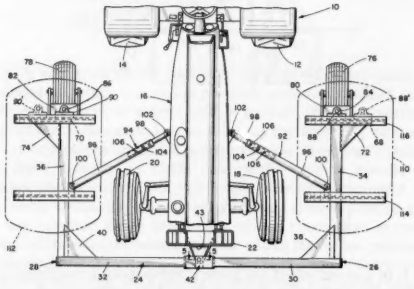
SEMI-MOUNTED CARRIER

Otto E. Johnson, Hinsdale; Roland J. Frase, Roselle, and Ernest G. Treptow, Westmont, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Nov. 11, 1974, Ser. No. 522,670

Int. Cl.² B60P *3/22*

U.S. Cl. 280—5 H **15 Claims**



1. A carrier adapted for supporting a load for transport by a tractor having a forwardly projecting vehicle frame portion, comprising:

a horizontal centrally articulated U-shaped frame having a pair of load-supportable legs disposed in flanking relation to said vehicle frame portion;

a pivot connection mounting said frame on the front of said vehicle frame portion for articulation of said legs relative to each other about a generally vertical axis;

a pair of caster wheels secured respectively to said legs proximate to the rearmost extent thereof whereby the frame is supported forwardly on said tractor on said pivot connection and rearwardly on said caster wheels;

and a pair of links connected respectively between said legs and the respective sides of said vehicle frame portion for maintaining said legs in spaced relation to the respective sides of said vehicle frame portion.

3,900,202

CONVERTIBLE UTILITY CART

James W. Doble, 418 Dovedale Dr., Whitby, Ontario, Canada

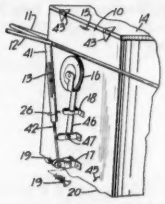
Filed Mar. 21, 1974, Ser. No. 453,269

Int. Cl.² B62B *13/18*

U.S. Cl. 280—8 **2 Claims**

1. A utility cart designed to be alternately towed either on wheels or on snow runners with the wheels raised above the bottom of the cart body, comprising:

a cart body formed with a bottom panel joined to two side panels and two end panels fitted with sled-like runners attached to the undersurface of the bottom panel of the cart body, with an assembly of two wheels each rotatably fitted to an end of a U-shape frame that is pivotably mounted to each of the two side panels of the cart body, said frame being of a size to extend about the side panels and alternately extend about either the first end panel or the second end panel of the cart body, depending upon the pivoted position of the frame, with the wheels that are attached to the frame ends oriented so that the bottom of the wheels lie below the plane of the undersurface of the sled-like runners when the frame is pivoted to extend about the said first end panel, and with said wheels oriented so that the bottom of the wheels lie above the plane of the bottom panel of the cart body when the frame is pivoted to extend about the said second end panel,



said frame integrally fastened to a tow bar that extends from the general mid-section of the frame in a direction away from the cart body, together with

a telescopic member fastened to one end to the assembly of the tow bar and frame, which telescopic member may be latched at its other end alternately to a bracket fastened to the first end panel or to a similar bracket fastened to the second end panel, for securing the two bar and frame assembly in either one or two positions for either towing the cart with the first end panel in the forward position with the wheels engaging the ground surface below the cart bottom or alternately towing the cart with the second end panel in the forward position and with the wheels upraised so that the sled-like runners contact the ground surface below the cart bottom.

3,900,203

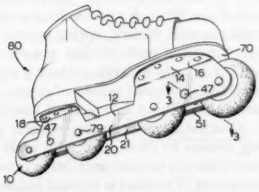
TANDEM WHEELED ROLLER SKATE

Adolph F. Kukulowicz, 10 Parkway Forest Dr., Apt. 801, Willowdale, Ontario, Canada

Filed July 8, 1974, Ser. No. 486,359

Int. Cl. A63c *17/14*

U.S. Cl. 280—11.2 **1 Claim**



1. A tandem-wheeled roller skate having a plurality of wheels arranged in single file substantially centrally of and along the length of a foot support platform comprising in combination:

A pair of longitudinally extending spaced apart frame plates projecting downwardly substantially at right angles from said platform and attached thereto to form a rigid structure therewith;

A hub assembly for each wheel;

A tire surrounding each hub assembly;

An axle means for each wheel projecting through said hub assembly and through aperture provided through said pair of frame plates;

Means to secure each axle between said frame plates with each wheel and hub assembly thereof free running therebetween;

At least one pressure brake plate extending between a pair of said wheels and having at least two annuli formed therein whereby one annuli is fittable over an axle of one wheel and the other is fittable over the axle of said other pair of wheels to allow said wheel to rotate freely with said brake plate positioned between said frame plate and said hub assembly of said wheel;

A disc surface provided outwardly of each wheel surrounding each hub assembly co-planar with the annuli of said brake plate; Means provided substantially midway of said brake plate between said pair of wheels adapted to bear against said plate to bend it inwardly against said disc surface of said wheel hub assembly thereby to induce braking pressure to said wheels.

3,900,204

MONO-SKI

Robert C. Weber, 3908 Calverton Dr., Hyattsville, Md. 20782

Filed June 25, 1973, Ser. No. 373,575

Int. Cl. A63c *5/04*

U.S. Cl. 280—11.13 S **14 Claims**

1. A mono-ski for skiing on snow having a width of about 10 to 12 inches and at least equal to the length of a user's boots, said ski having an intermediate portion with concavely formed opposite sides and said ski further having boot binding means mounted thereon for securing both of the user's boots in a fore-aft relationship with respect to each other on the ski with both of said boots extending at a substantial angle to the longitudinal axis of the ski, said binding means being disposed to position a rearwardly positioned boot at a greater angle than the forwardly positioned boot with respect to the longitudinal axis of the ski.

3,900,205

SKI SAFETY BINDING

Brigette Sittmann, Stuttgart, Germany, assignor to Vereinigte Baubeschlagfabriken Gretsch & Co. GmbH, Germany

Continuation of Ser. No. 190,091, Oct. 18, 1971, abandoned. This application Aug. 13, 1973, Ser. No. 387,638

Claims priority, application Germany, Oct. 22, 1970, 2051758

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 K **58 Claims**

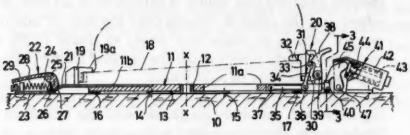
1. A ski safety binding for binding a ski boot to a ski comprising:

a sole plate engageable with and extending the length of the sole of the ski boot,

pivot mounting means for pivotably mounting said sole plate so as to be rotatable about an axis extending perpendicular to an upwardly facing sole plate surface,

releasable sole plate locking means for locking the sole plate to said ski in a fixed rotative position,

hold down means separate from said sole plate locking means, said hold down means being connected to and movable with said sole plate and including boot engaging means engageable with an upper side of said sole, said hold down means being movable between a hold down position with said sole clamped against said sole palte and



a released position with said sole released from said sole plate,

and releasable hold down locking means for releasably locking said hold down means in said hold down position, wherein one of said sole plate locking means and said hold down locking means is automatically movable from the locked position thereof in response to a predetermined strong force acting on the ski boot,

and wherein said sole plate is freely rotatable about said axis and movable away from said pivot mounting means and said ski when said sole plate locking means is in said unlocked position.

3,900,206

SAFETY SKI BINDING

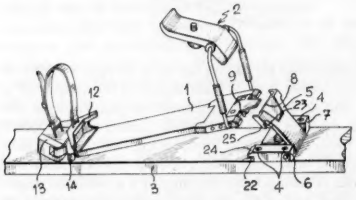
Georges Pierre Joseph Salomon, 34 Avenue de Loverchy, Annecy, France

Filed June 28, 1973, Ser. No. 374,623

Claims priority, application France, July 3, 1972, 72.23975

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 E **15 Claims**



1. A safety binding for skis for putting on a ski automatically comprising:

a. first and second releasable holding elements binding the ends of a ski boot;

b. a supporting element adapted to tilt up and down and to move substantially longitudinally in relation to a base plate secured to the ski, said supporting element being integral with and supporting said first holding element;

c. an irreversible locking system intercalated between said base plate and said supporting element; said supporting element being movable between two positions; said supporting element being irreversibly locked by said irreversible locking system when the boot is in place in the binding; a first high position for which said first holding element is raised and disengaged from the boot, a second low position for which said supporting element is locked to said base plate by said locking system while said supporting element moves substantially longitudinally and for which said first holding element is in abutment against the boot, said second position being obtained when a skier puts on a ski

by pivoting his foot about the end of the boot associated with said second holding element; and by pressing the opposite end of the boot against said supporting element;

d. a system of springs urging said supporting element in a substantially longitudinal movement, said springs being compressed as a result of the skier pivoting his foot; said longitudinal movement being towards the rear if the boot pivots about the front end thereof.

3,900,207

TOE FIXTURE FOR A SKI SAFETY BINDING

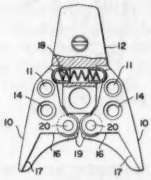
Michio Iizuka, Tokyo, Japan, assignor to Hope Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1973, Ser. No. 413,627

Claims priority, application Japan, Feb. 20, 1973, 48-2040

Int. Cl. A63c *9/08*

U.S. Cl. 280—11.35 T **9 Claims**



1. A toe fixture for releasably securing a toe of a ski boot to a ski, the toe fixture being adapted for use with a heel fixture capable of exerting a forwardly directed force toward said toe fixture through a ski boot from a position of mounting of a heel fixture upon a ski remote from said toe fixture, said toe fixture comprising a frame, means for mounting said frame on a ski, a pair of toe-receiving pieces having front and rear ends, means pivotally supporting said toe-receiving pieces at pivot points located adjacent the front ends thereof upon said frame in such a manner that the rear ends of said toe-receiving pieces are turnable in a plane parallel to the plane of a ski, said toe-receiving pieces having recesses formed in the rear ends thereof for receiving a toe of a ski boot, said recesses defining vertical wall portions constituting side pressure bearing portions for a toe of a ski boot, means between the front and rear ends of each toe-receiving piece for making sliding contact with a toe of a ski boot which define forward pressure bearing portions for a ski boot toe under the influence of the forwardly directed force of an associated heel fixture, the points of contact between said slidable contact making means and a toe of a ski boot being located substantially inside of imaginary lines extending between the center of a heel end of a ski boot fixed in position of mounting of a heel fixture and the respective pivot points of said toe-receiving pieces and adjacent a longitudinal center line through said toe fixture and associated ski in the normal position thereof, spring means for normally tending to urge the front ends of said toe-receiving pieces away from each other, said slidable contact making means in cooperation with the aforesaid points of contact and imaginary lines maintain a ski boot in a normal position of use by the forwardly directed force exerting against said slidable contact making means to pivot said rear ends of said toe-receiving pieces relatively toward each other when the associated one of said points of contact is located inside of its associated imaginary line and release a ski boot by the forwardly directed force exerting against said slidable contact making means to pivot said rear ends of said toe-receiving pieces relatively away from each other when the associated one of said points of contact is located outside of its associated imaginary line, said toe fixture being devoid of linkage means between said slidable contact making means, and said pivot

means forming the sole connection between said frame and said toe-receiving pieces.

3,900,208

SLEDS

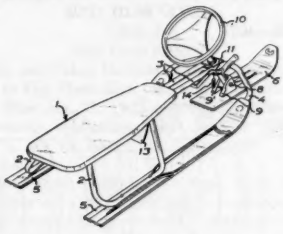
Stig Gunnar Hjelmquist, Norraby, Tranas, Sweden

Filed Mar. 16, 1973, Ser. No. 341,822

Claims priority, application Sweden, Mar. 17, 1972, 3467/72

Int. Cl. B62b *5/00*

U.S. Cl. 280—16 7 Claims



1. A sled comprising a frame, a platform mounted on said frame, at least one runner fixed in relation to said frame and having a bottom surface defining the sliding plane of the sled, a steering wheel carrying rod rotatably mounted on said frame and extending upwardly from said sliding plane, at least one steering runner connected to the lower end of said steering wheel carrying rod, and runaway preventing means disposed at and continuously urging said steering runner during operation of the sled to an angular position with respect to the longitudinal direction of the fixed runner, said runaway preventing means being overcome by actuation of said steering wheel during operation of the sled by person riding thereon and displacing said steering runner when said steering wheel is not actuated during operation of the sled.

3,900,209

COMBINATION GOLF CADDIE CAR AND GOLF BAG

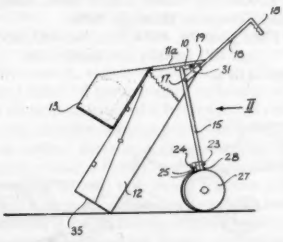
Tomas Paul McDonnell, 143 Lower Kilmacud Rd., Stillorgan, County Dublin, Ireland

Filed Oct. 19, 1972, Ser. No. 298,808

Claims priority, application Ireland, Oct. 26, 1971, 1356/71

Int. Cl. B62b *1/20*

U.S. Cl. 280—36 C 4 Claims



1. A combination golf bag and caddie car comprising:

a golf bag container; said container having a first side; an elongated recess into said container through said first side and extending along said container and said container first side; a frame element on said container and communicating into said recess such that a strut extending into said recess can be connected to said frame element;

an elongated strut having an upper end that extends into said recess and that is pivotally connected to said frame element at a first pivot; said strut being pivotable about said first pivot out of said recess and wholly into said recess; said strut having a lower end;

a handle member including an elongated arm; said handle member having a respective third end that is pivotally connected to said strut intermediate said ends of said strut at a second pivot on said strut, such that drawing said handle member out of said recess pivots said strut out of said recess; said handle member being of a length and being at an orientation to fit within said recess and to be pivotable between a rest position in said recess and alongside said strut and an operative position outside said recess; between said rest and said operative positions, said handle member being swept through an obtuse angle; wheel support legs hingedly connected to said lower end of said strut for movement from a first position in which said wheel support legs lie alongside of and substantially parallel to said strut to a second position in which said wheel support legs are located below and at an angle to said strut and are also located in a plane perpendicular to the motion of said strut under the influence of said handle member; said wheel support legs being movable into both of said first and second positions when said strut is located outside said recess and being at said first position when said strut is located inside said recess; wheels detachably mounted on said support legs.

3,900,210

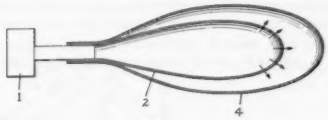
ENERGY ABSORPTION ARRANGEMENT IN VEHICLE PASSENGER RESTRAINT SYSTEM

Thomas E. Lohr, Warren, and John J. Sack, Bloomfield Hills, both of Mich., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 83,557, Oct. 23, 1970, abandoned. This application Nov. 10, 1972, Ser. No. 305,383

Int. Cl. B60r *21/10*

U.S. Cl. 280—150 AB 3 Claims



1. A restraint system comprising an outer bag adapted to be filled with an inflating gas, said outer bag being composed of nylon and being stretchable over its original inflated volume, an energy absorbing elastic knitted inner bag having apertures therein and located within said outer bag, means for passing said inflating gas through said apertures and into said outer bag to stretch said inner bag in the range of at least 50-100 percent of its volume without bursting said inner bag.

3,900,211

PYROTECHNIC ACTUATED VALVE

Lowell L. Russell, Aptos, and Claude E. Campbell, Gilroy, both of Calif., assignors to Teledyne McCormick Selph, Hollister, Calif.

Filed Apr. 4, 1974, Ser. No. 457,890

Int. Cl.[2] B60R *21/08*

U.S. Cl. 280—150 AB 6 Claims

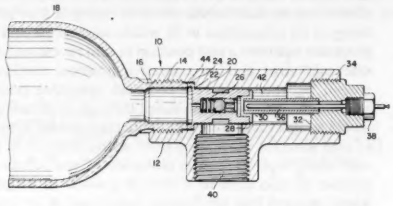
1. A pyrotechnic actuated valve connectable to a container of fluid under pressure, comprising:

A. a hollow valve body having an inlet at one end connectable to a container of fluid under pressure, and terminating in an internal flange;

B. said hollow valve body including a poppet cavity with a discharge outlet therefrom;

C. a movable poppet in said poppet cavity including an external flange interconnected to a poppet body by a shearable web, said flange being engageable against said internal flange of said inlet and said poppet body normally closing said outlet;

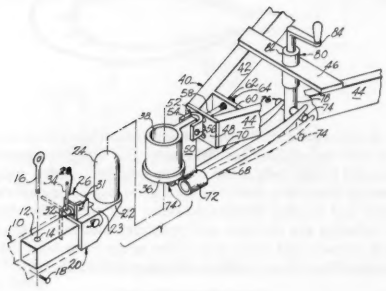
D. a poppet support positioned in operable engagement with said poppet, comprising a dished disc in engagement with said movable poppet, a retainer at the end of said valve body remote from said inlet, and a hollow,



frangible tube held in longitudinal compression between said disc and said retainer; and

E. a pyrotechnic charge internal of said frangible support tube adapted upon activation to disintegrate said support tube whereupon fluid pressure moves said poppet, after shearing said shearable web, to open said outlet with disintegrated material of said tube and pyrotechnic residue being maintained free from said outlet by the moved poppet.

3,900,212
TRAILER HITCH
Marlin B. Ewing, 259 S. Bayshore Dr., Valparaiso, Fla. 32580
Filed Sept. 16, 1974, Ser. No. 506,027
Int. Cl. B62d *53/00*
U.S. Cl. 280—406 A **11 Claims**



1. In a detachable hitch between a lead towing vehicle and a towed trailer:

a. a lead vehicle having a substantially vertical hitch pin mounted thereon,

b. a trailer having a coupling means thereon engageable with said verticalpin on said lead vehicle,

c. ground engaging means, for elevating and lowering said trailer with respect to said hitch pin for the purpose of hitching and unhitching said trailer from said towing vehicle,

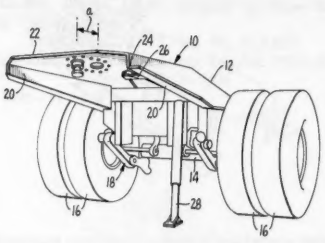
d. means mounting said coupling means on said trailer for swinging movement about a transverse axis thereacross,

e. other means mounting said coupling means on said trailer for rotary movement about a longitudinal axis of said trailer,

f. an equalizer means attached to said coupling and engaging said trailer when in towed position on said lead vehicle,

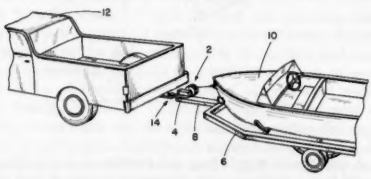
g. and equalizer stressing means on said trailer for placing said equalizer means under stress when said trailer is being towed.

3,900,213
ADJUSTABLE KING PIN
Joseph J. Cunha, Castro Valley, Calif., assignor to Overhead Door Corporation, Dallas, Tex.
Filed Dec. 12, 1974, Ser. No. 531,983
Int. Cl.² B62D *53/08*
U.S. Cl. 280—407 **6 Claims**



1. King pin attachment structure for use on a vehicle chassis suspended at least on end thereof on a wheel supported axle, said structure comprising: a generally horizontally disposed mounting plate on the chassis, said plate having at least two spaced openings formed therein so as to open to the exterior underside of the chassis, said openings being proportioned for the extension of a king pin therethrough; a king pin plate proportioned to overlie and cover both of the openings in the mounting plate, said king pin plate having a king pin fixed thereto and extending downwardly therefrom for select extension through one or the other of the openings; and securing means to selectively secure said king pin plate to the mounting plate whereby said plates may be secured in locked engagement with one another with the king pin extending through one or the other of the openings or released from such engagement to provide for rotation of said plate to position the king pin in one or the other of the openings.

3,900,214
WINCH MOUNT AND PLATE WITH COUPLER BALL ADAPTER
Norman D. Brockelsby, Grand Island, Nebr., assignor to Dutton-Lainson Company, Hastings, Nebr.
Filed June 28, 1974, Ser. No. 483,929
Int. Cl.² B66D *1/00*; **B60D** *1/06*
U.S. Cl. 280—414 R **11 Claims**



1. A device for detachably mounting a winch mechanism to a ball hitch structure comprising, in combination:

a hitch plate including a forward slot for cooperation with the ball hitch structure;

a base member having a first end and a pair of upwardly and inwardly turned flange portions, said flange portions converging towards said first end;

means for securing said base member to said hitch plate;

a winch-carrying member having a pair of downwardly extending edge portions, said flange portions being adapted to receive said edge portions, said flange and edge portions cooperating in an engaged state; and

means for securing said winch mechanism to said winch-carrying member, whereby said winch mechanism is detachably secured to said base member in said engaged state.

3,900,215

RECORD SHEET

Hajime Kato, and Takao Hayashi, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Ashigara, Japan

Filed Jan. 22, 1973, Ser. No. 325,720

Claims priority, application Japan, Jan. 24, 1972, 47-8830

Int. Cl. B41c *1/06;* **B41m** *5/00*

U.S. Cl. 282—27.5 **17 Claims**

1. A record sheet comprising a base sheet and coated thereon a layer of a developer which produces a colored image upon contact with an electron-donating colorless chromogenic material, said developer comprising (1) a metal compound of an aromatic carboxylic acid and (2) from 0.5 to 10 parts by weight per 100 parts by weight of the metal compound (1) of a salt of a metal.

3,900,216

METHOD FOR PRODUCING CLAY COATED PAPER FOR PRESSURE SENSITIVE COPYING PAPER

Takao Hayashi, and Hiroharu Matsukawa, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara-shi, Japan

Continuation of Ser. No. 83,211, Oct. 22, 1970, abandoned. This application Feb. 2, 1973, Ser. No. 328,982

Claims priority, application Japan, Oct. 22, 1969, 44-84537

Int. Cl. B41c *1/06;* **B41m** *5/00*

U.S. Cl. 282—27.5 **13 Claims**

1. A method for preparing a clay-coated paper for pressure-sensitive copying which comprises applying to a paper support a slurry comprising an alkali dispersing agent, an anionic high molecular weight electrolyte, an electron-acceptive adsorbent clay, and a binder, said clay being reactive with a color-former to form a distinct color, the concentration of said electrolyte being in the range of from 0.2 to 5.0% by weight, based on the clay, and, said anionic high molecular weight electrolyte being selected from the group consisting of an alkali metal salt of polyacrylate, alginate, a styrene-maleicanhydride copolymer, polyglutamate, polyasparaginate, polymethacrylate, methyl-vinylether-maleic anhydride copolymers, a butadiene-methacrylate copolymer, a polyethylene-maleic anhydride copolymer, a polyvinylbenzene sulfonate, carboxymethyl cellulose, carboxyethyl cellulose, gum arabic, pectin, pectinic acid, carboxymethyl starch, starch sulfate, starch phosphate, the carboxymethyl-ether of hydroxyethyl cellulose, and the sulfate ester or phosphate ester of a hydroxyethyl cellulose.

5. A pressure-sensitive copying paper comprising a support paper having coated thereon a layer comprising an alkali dispersing agent, a clay, a binder, and an anionic high molecular weight electrolyte, said clay being reactive with a color-former to form a distinct color, said electrolyte being present in a range of from 0.2 to 5.0% by weight, based on the clay, and said anionic high molecular weight electrolyte being selected from the group consisting of an alkali metal salt of polyacrylate, alginate, a styrene-maleicanhydride copolymer, polyglutamate, polyasparaginate, polymethacrylate, methyl-vinylether-maleicanhydride copolymers, a butadiene-methacrylate copolymer, a polyethylene-maleic anhydride copolymer, a polyvinyl-benzene sulfonate, carboxymethyl cellulose, carboxyethyl cellulose, gum arabic, pectin, pectinic acid, carboxymethyl starch, starch sulfate, starch phosphate, the carboxymethyl-ether of hydroxyethyl cellulose, and the sulfate ester or phosphate ester of a hydroxyethyl cellulose.

3,900,217

PRESSURE-SENSITIVE COPYING PAPER

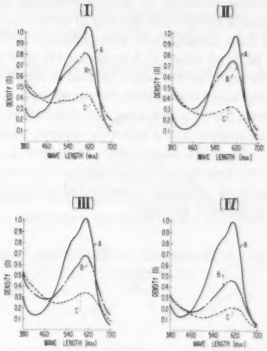
Takao Hayashi; Hiroharu Matsukawa, and Sadao Ishige, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Continuation-in-part of Ser. No. 152,831, June 14, 1971, abandoned. This application July 11, 1973, Ser. No. 378,105

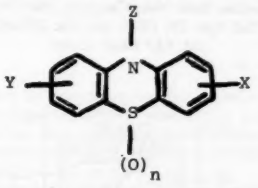
Claims priority, application Japan, June 13, 1970, 45-51116

Int. Cl. B41c *1/06;* **B41m** *5/00*

U.S. Cl. 282—27.5 **3 Claims**



1. A pressure-sensitive copying paper comprising a support having coated thereon a layer of microcapsules containing a substantially colorless electron donor color-forming compound capable of forming a distinct color when contacted with an electron acceptor solid acid, said layer containing a colorless phenothiazene compound incapable of forming a distinct color when contacted with the electron acceptor solid acid, the amount of said phenothiazene compound being 10 to 200% by weight based on the color former, said phenothiazene compound being represented by the formula,



wherein *n* is 0, 1 or 2, X, Y and Z each is a hydrogen atom, an alkyl group, a halogen atom, a nitro group, an acylamino group, a hydroxyl group, an alkoxy group, an acyloxy group, an alkoxycarbonyl group, an alkylsulfonylamino group or an arylsulfonylamino group, said alkyl group and alkyls attached to the other substituents having 1 to 8 carbon atoms, and all aryl groups being phenyl or naphthyl groups.

3,900,218

DESENSITIZER COMPOSITION

Akio Miyamoto, and Hiroharu Matsukawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Aug. 30, 1973, Ser. No. 393,089

Claims priority, application Japan, Aug. 30, 1972, 47-87011; Nov. 30, 1972, 47-120465

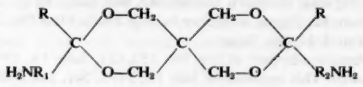
Int. Cl. B41m *5/18*

U.S. Cl. 282—27.5 **17 Claims**

1. A developer sheet comprising a color developer layer and

a desensitizer composition for desensitizing a color developer capable of reaction with a substantially colorless color former to form a color containing as a desensitizer at least one of:

a. a spiroacetal diamine compound represented by the following general formula:

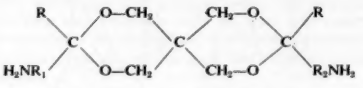


wherein R represents a hydrogen atom or an alkyl group, and R_1 and R_2 each represents a straight or branched chain alkylene residue, or

b. the reaction product of said spiroacetal diamine compound with a compound having at least one oxirane ring, wherein said desensitizer composition is present in an amount of from about 0.5 to about 10 g/m^2 on said color developer layer in the areas of said color developer layer containing said desensitizer composition.

10. A process for desensitizing the coloration generated by a color former contacting a color developer which comprises applying to a layer of said color developer a desensitizing composition containing as a desensitizer at least one of

a. a spiroacetal diamine compound represented by the following general formula:



wherein R represents a hydrogen atom or an alkyl group, and R_1 and R_2 each represents a straight or branched chain alkylene residue, or

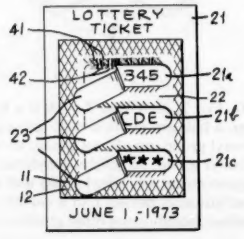
b. the reaction product of said spiroacetal diamine compound with a compound having at least one oxirane ring.

3,900,219

DOCUMENT HAVING A CONCEALED MARKING AND METHOD OF MAKING SAME

Salvatore F. D'Amato, Floral Park; John J. Kimball, Brooklyn, both of N.Y., and Oliver Lednicer, Hackensack, N.J., assignors to American Bank Note Company, New York, N.Y.

Filed Apr. 23, 1973, Ser. No. 353,467
Int. Cl.[2] B42D *15/00*
U.S. Cl. 283—6 **17 Claims**



1. A document having a concealed marking, comprising:

a. a base sheet having a marking printed on one side thereof in at least one area spaced inwardly from all edges of the sheet;

b. an opaque sheet smaller than the base sheet and overlying said area, said opaque sheet being separable from the base sheet;

c. a cover sheet overlying said opaque sheet and larger than the opaque sheet so that portions of the cover sheet extend beyond the opaque sheet throughout at least a major part of its periphery, said cover sheet being adhesively attached to the opaque sheet and having said extending portions adhesively attached to the base sheet;

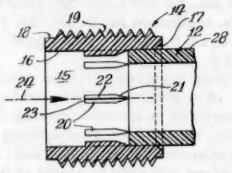
d. said opaque sheet having one edge accessible so that it may be gripped to displace the opaque sheet and tear the overlying attached cover sheet along the edges of the opaque sheet to reveal the marking on the base sheet, so that the torn edges of the cover sheet provide a permanent indication that the opaque sheet has been displaced.

3,900,220

THREAD ADAPTOR

William J. Buchser, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 3, 1973, Ser. No. 420,971
Int. Cl.[2] F16L *25/00*
U.S. Cl. 285—177 **13 Claims**



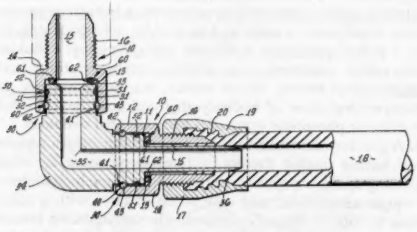
1. Structure for providing a threaded connection on an annular wall formed of a soft material, comprising an annular element having radially inner and outer surfaces, said element being formed of a material substantially harder than said wall material, a radially projecting rib formed on one of said surfaces having a tapered axially inner first end, an opposite axially outer second end defining a radial shoulder, and a constant cross section mid-portion between said ends, and a coaxial thread formed in the other of said surfaces, said one surface being adapted to fit in facial engagement with said annular wall with said element locked to the annular wall by the radial shoulder extending into the annular wall against axially outward withdrawal from the annular wall.

3,900,221

ANGLE ADAPTOR FITTING

Robert E. Fouts, 2152 Van Karajan Dr., San Pedro, Calif. 90732

Filed Jan. 28, 1974, Ser. No. 437,282
Int. Cl.[2] F16L *27/00*
U.S. Cl. 285—276 **3 Claims**



1. In a swivel fitting for rotatably mounting two ends of hose or pipe including:

a female member having a generally cylindrical sidewall and a generally circular rear wall closing the sidewall;

a male member inserted into said female member and having a generally cylindrical sidewall of an outside diameter smaller than the inside diameter of the female member, said male member having a generally circular front wall spaced apart from said rear wall of said female member, said mem-

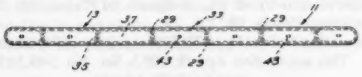
bers having an aligned fluid opening extending perpendicular to the front and rear walls;
locking means between the male and female members to maintain a given orientation of said male member in said female member;
a circumferential groove extending between said cylindrical sidewalls when said male and female members are maintained in said given orientation by said locking means;
first resilient seal means comprising an O-ring of resilient material having a generally circular cross-section and located within and extending around said circumferential groove, said circumferential groove having a depth and width and wherein said O-ring protrudes out of said groove; an annular groove between said rear wall and said front wall, said annular groove having a width and a depth, said annular groove being formed on said rear wall; and
second resilient seal means within said annular groove, the improvement comprising the provision of:
said inside diameter of said female member, said outside diameter of said male member, and said depth of said groove being of such dimension that said seal means is compressed when said male and female members are maintained in said given orientation by said locking means so that said first seal means seals the cylindrical walls, allows for rotation of said members relative to each other, and maintains alignment of said members; said circumferential groove having a depth and width, wherein the radius of said O-ring is greater than the depth of said groove so that said O-ring protrudes from said groove;
said second seal means being of a thickness relative to the depth of said annular groove and the spacing of the front wall and rear wall established by said given orientation such that the second seal means is compressed between the front wall and the rear wall when said members are maintained in said given orientation by said locking means so that said second seal means forms a seal between the end wall and the front wall,
said second seal means including an O-ring of resilient material having a circular cross-section;
the radius of said O-ring of said second seal means being greater than the depth of said annular groove so that said O-ring of said second seal protrudes from said annular groove;
the distance of protrusion of said O-ring of said second seal means from said annular groove is greater than the protrusion of said O-ring of said first seal means from said circumferential groove.

3,900,222

COMPARTMENTED RESILIENT BUMPER ASSEMBLY

George H. Muller, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 194,934, Dec. 2, 1971. This application Nov. 9, 1973, Ser. No. 414,598
Int. Cl.[2] B60R *19/10*
U.S. Cl. 293—71 P **3 Claims**



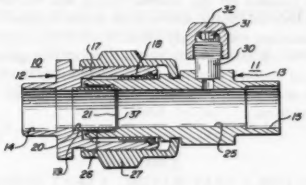
1. A resiliently deformable bumper assembly for a vehicle and the like comprising:
a rigid elongate backing member secured to the vehicle body,
a resiliently deformable elongate outer shell,
means securing said outer shell to the backing member,
said outer shell and said backing member forming a substantially sealed elongate enclosure,
a plurality of partitions extending generally transversely to said outer shell and dividing said enclosure into a plurality of consecutive compartments, each said partition serving as a wall for a pair of adjacent compartments,
passage means interconnecting said compartments and permitting passage of air and the like between adjacent compartments under unimpacted conditions,
said partitions and passage means comprising throttling means restricting substantial air flow between adjacent compartments and thereby preventing immediate collapse of an individual compartment upon a sudden impact confined to that compartment,
an elongate inflatable inner tube member received within said enclosure,
said tube member having a plurality of longitudinally spaced constrictions dividing said tube member into a plurality of sausage-like segments,
each of said compartments containing one of said segments conforming generally to the interiors of said compartments,
said partitions positioned about and engaging said constrictions.

3,900,223

PIPE COUPLING

James D. Schafer, Rockford, Ill., and Frederic W. Pollman, Ames, Iowa, assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 23, 1974, Ser. No. 435,894
Int. Cl. F16l *35/00*
U.S. Cl. 285—4 **9 Claims**

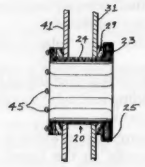


1. A coupling for connecting conduits, comprising:
a male member having a body with a flow passage therethrough and an outer cylindrical sleeve portion;
a diaphragm across the end of said sleeve portion, closing the flow passage;
a cylindrical tube inside said body defining a part of the flow passage, spaced inwardly from and concentric with the outer sleeve portion and having an end which is spaced inwardly of said diaphragm;
a female member having a cylindrical body with a flow passage therethrough;
a diaphragm on the end of the female body member closing the flow passage; and
means for drawing the male and female body members together in coaxial relation, the end of the female body member engaging and rupturing the diaphragm over the end of the male body member and thereafter the end of the tube inside the sleeve of the male member engaging and rupturing the diaphragm over the end of the female member, establishing unobstructed communication between the flow passages, the ends of the cylindrical tube and the female body member and both diaphragms being in planes normal to the coupling axis whereby the tube and body member ends engage the respective diaphragms to apply hoop tension thereto.

3,900,224
BOOT

Andrew P. Copeland, 3339 E. Avenue S, Palmdale, Calif. 93550

Filed Jan. 23, 1974, Ser. No. 435,752
Int. Cl. B60p 3/32
U.S. Cl. 296—23 MC 7 Claims



1. A boot for providing an air corridor in the spacing between facing open windows of a cab of a vehicle and a recreational housing accessory mounted to the vehicle, the boot comprising:

a first frame;

a sleeve having one end substantially permanently secured to the first frame, the first frame and the sleeve being adapted for installation so that the first frame abuts an interior facing side of one of the windows and the sleeve extends across said spacing and through the other window;

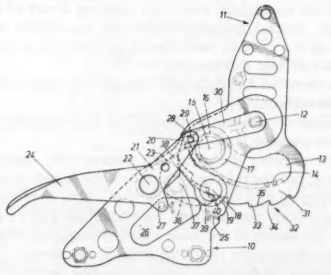
a second frame positionable to abut the other window on its interior facing side; and

means for releasably fastening the other end of the sleeve to the second frame, said means including first fastening means located on the second frame and second fastening means located on the sleeve so as to be engageable with the first fastening means only when the sleeve is pulled taut, the sleeve being held in the tension upon engagement of the first and second fastening means so as to exert a pull on each frame thereby holding them flush against the respective windows.

3,900,225
FITTING FOR A SEAT HAVING A SEAT ELEMENT AND A TILTABLE BACKREST ELEMENT

Egon Wirtz, Remscheid-Lennep, and Paul Werner, Remscheid, both of Germany, assignors to Fritz Keiper, Remscheid-Hasten, Germany

Filed Feb. 6, 1974, Ser. No. 440,036
Claims priority, application Germany, Feb. 9, 1973, 2306312
Int. Cl. B60n 1/06
U.S. Cl. 297—367 9 Claims

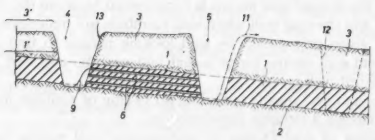


1. A fitting for a seat having a seat element and a tiltable backrest element, particularly for a vehicle seat, comprising a first plate member connectable with one of said elements; a second plate member connectable with the other of said elements; pivot means connecting said members for relative pivotal displacement about a pivot axis; an arcuate gear segment concentric with an arcuate ratchet segment on said second plate member, both said segments having centers of curvature which coincide with said axis; a gear; journalling means journalling said gear on said first plate member so that the teeth of said gear mesh with said gear segment; pawl means; having first and second ends operatively engageable with said ratchet segment, said second end being normally biased out of engagement with said ratchet segment and mounting means pivotably mounting said pawl means on said first plate member, the pawl means being freely rockable and wherein rapid relative pivoting of said members about said axis causes said first end of said pawl means to cam said second end into blocking engagement with said ratchet segment to prevent further relative pivoting, while during slower relative pivoting of said members about said pivot axis said second end is free to move out of blocking engagement with said ratchet segment.

3,900,226
HYDRAULIC MINING METHOD

Lodewikus N. J. de Jong, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 22, 1974, Ser. No. 444,924
Claims priority, application United Kingdom, Feb. 26, 1973, 9301/73
Int. Cl.[2] E21C 25/60, 41/04
U.S. Cl. 299—17 5 Claims



1. A process of mining valuable materials from an underground seam, which method comprises

digging at least two trenches in the earth surface, said trenches at least reaching into said seam;

making at least one dipping passage extending between the trenches, said passage extending through at least the major part of the seam;

disintegrating material in the side walls of said passage while simultaneously contacting the disintegrated material with a fluid so that a slurry of said disintegrated material and said fluid flows through the passage towards the lower end thereof into one of the trenches; and

flowing this slurry out of the trench to the earth surface.

3,900,227
BRAKE CONTROL ARRANGEMENT FOR SKIDDERS

Duane R. Smith, Montgomery, and Rodney H. Anderson, Naperville, both of Ill., assignors to Caterpillar Tractor Company, Peoria, Ill.

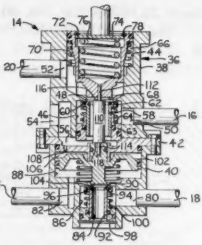
Continuation of Ser. No. 130,938, April 5, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 349,315
Int. Cl. B60t 13/14
U.S. Cl. 303—7 13 Claims

1. An air pressure actuated hydraulic brake system having a first set of hydraulic motors actuated by a first master cylinder to brake the front wheels of a vehicle and a second set of hydraulic motors actuated by a second master cylinder to brake the rear wheels of said vehicle, a source of air pressure for actuating said master cylinders and control valve means for controlling the actuation of said master cylinders, the improvement comprising:

actuating means operatively connected to said valve means;

said control valve means responsive to said actuating

means for supplying full actuating pressure to said first master cylinder prior to and independently of the application of full actuating pressure to said second master cylinder.



3,900,228

WHEEL SLIDE PROTECTION SYSTEM

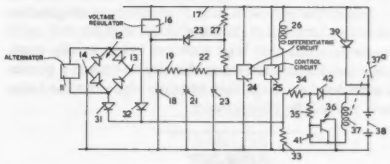
Leonard Ramsey Hiscox, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed July 18, 1973, Ser. No. 380,225

Claims priority, application United Kingdom, July 18, 1972, 33514/72; July 18, 1972, 33515/72

Int. Cl. B60t *8/12*

U.S. Cl. 303—21 CG **8 Claims**



1. A wheel slide protection system for a vehicle, comprising means operable in use to produce a signal representing a rotational speed of a wheel, a differentiating circuit to which said signal is applied, the differentiating circuit producing an output dependent upon the rotational deceleration of the wheel, control means coupled to the differentiating circuit and operable in use to release the brakes from the wheel when said deceleration exceeds a predetermined value, and means operable when the wheel speed is below a predetermined value for rendering the system inoperative by clamping the input of the differentiating circuit.

3,900,229

BRAKE CONTROL VALVE INCLUDING FAILSAFE MEANS FOR MANUALLY PUMPING BRAKES OF A VEHICLE

Royce H. Husted, 711 Lakeside Dr., Wheaton, Ill. 60187

Continuation-in-part of Ser. No. 327,761, Jan. 29, 1973, Pat. No. 3,827,765. This application May 14, 1974, Ser. No. 469,631

Int. Cl.² B60T *15/06*

U.S. Cl. 303—52 **7 Claims**

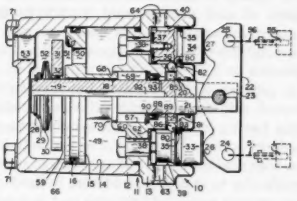
1. In a brake valve comprising in combination;

a housing defining a bore closed at one end by an end-wall, a shaft slideably disposed through said end-wall having a first end for accepting an operator's force input and a second end in said bore,

a moveable-wall which is moveable by said second end of said shaft including an annular piston slideably disposed in said bore and a reaction piston, said pistons defining between themselves a circumferential variable orifice adapted to narrow and thereby become restrictive in response to said force input,

a collapsible chamber defined by said bore, by said end-wall and by said moveable-wall, said chamber having a fluid inlet including a check valve means and a pressure output port,

and a flow passage through said brake valve starting at said inlet, passing into said chamber and exiting said chamber through said annular piston and said variable orifice,



so that during power-on operation said force input causes the narrowing of said variable orifice and a restriction of flow through the flow passage which in turn generates pressure at the pressure output port, and during power-off operation said force input causes a closing of said variable orifice and a movement of said moveable-wall toward said end-wall thereby decreasing the volume of said chamber and manually pumping pressurized fluid through said output port.

3,900,230

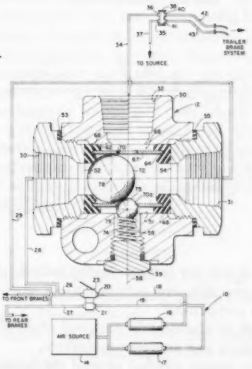
PNEUMATIC BRAKE SYSTEM INCORPORATING A DOUBLE CHECK VALVE

Harold Durling, Elsie, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed May 13, 1974, Ser. No. 469,088

Int. Cl. B60t *17/22*

U.S. Cl. 303—84 A **8 Claims**



1. In a pneumatic brake system for a tractor-trailer type vehicle including a source of compressed air; a dual application valve having an inlet port in fluid communication with said source, a first outlet in fluid communication with the front brakes of said tractor, a second outlet in fluid communication with the rear brakes of said tractor, said dual application valve being manually operable to admit service air at signal pressure

into said first and second outlets, said service air being at approximately equal pressures in said first and second outlets; a first line in fluid communication with said first outlet and a second line in fluid communication with said second outlet of said dual application valve; a double check valve having a first inlet in fluid communication with said first line, a second inlet in fluid communication with said second line and an outlet; a tractor protector valve having a first inlet in fluid communication with said first outlet of said double check valve, a second inlet in fluid communication with said source of pressure, first and second outlets in fluid communication with the trailer brake system of said vehicle, said tractor protector valve normally communicating said first inlet with said first outlet and said second inlet with said second outlet and automatically responsive to a predetermined decrease in said supply pressure to prevent communication between said inlets and outlets thereof; said double check valve comprising:

a housing having a central bore axially extending therethrough, an outlet perpendicular to and in fluid communication with said bore and a blind passage opening to and perpendicular to said bore, said bore in fluid communication at one end with said first inlet and in fluid communication at its opposite end with said second inlet;

a circular valve seat at each end of said bore;

a spherical valve element in said bore;

cage means within said bore containing said sphere and permitting said sphere to roll into contact with either one of said circular seats, said cage means including a plurality of openings in an array axially aligned with said blind passage and said outlet, one of said openings aligned with said passage; and

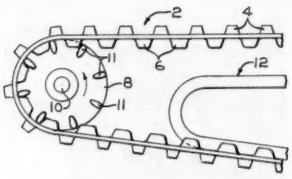
spring-biased ball detent means in said blind passage and extending through said aligned opening to maintain said sphere in sealing engagement with either one of said seats at any given time at a minimum contact force requiring air pressure at the sealed inlet to be at least 2 psi greater than air pressure at the open inlet to shift said sphere within said cage means.

3,900,231

MOLDED TRACK FOR A TRACK-LAYING VEHICLE

George D. Ohm, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 23, 1973, Ser. No. 408,610
Int. Cl.[2] B62D 55/24
U.S. Cl. 305—35 EB 7 Claims



1. A flexible track for a track laying vehicle, the vehicle having at least one slide rail adapted to slidably engage the track, the track comprising:

an endless belt of elastomeric material, the belt having an inner periphery and an outer periphery,

drive engaging means molded around the inner periphery,

tread means molded upon the outer periphery thereof, and

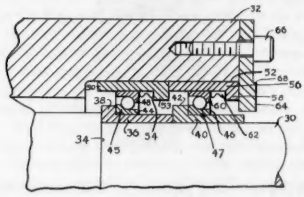
at least one low friction slide rail bearing surface extending continuously longitudinally around the inner periphery of the belt wherein the bearing surface comprises a woven fabric, the fabric partially embedded in and integrally molded to the inner periphery of the belt and partially exposed for operative engagement with the at least one slide rail.

3,900,232

ARRANGEMENT FOR PRELOADING BEARINGS

John E. Rode, Fonda, N.Y., assignor to Temper Corporation, Fonda, N.Y.

Filed Sept. 26, 1973, Ser. No. 401,117
Int. Cl. F16c 35/06
U.S. Cl. 308—1 R 28 Claims



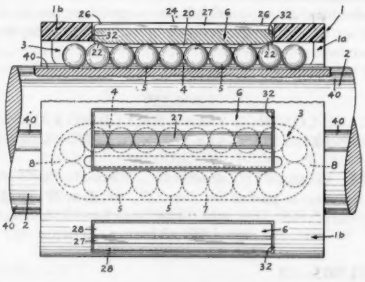
1. In combination; first and second relatively rotatable members, at least two thrust sustaining antifriction bearings interposed between said members in axially spaced relation and each bearing having first and second races pertaining to and nonrotatable relative to said first and second members respectively, first abutment means stationary on said first member and engaging one axial side of said first races, second abutment means axially slidable on said second member and in opposed relation to the other axial sides of said second races, axially compressible load element means interposed between said second abutment means and said second races, and clamp means on said other member clamping said second abutment means thereto with said load element means between said second abutment means and the said second races of said bearings, each said load element being axially compressible at a predetermined force thereby to impart a predetermined axial load on each said bearing when the load element means are axially compressed.

3,900,233

LINEAR MOTION BALL BEARING ASSEMBLY AND BALL CONFORMING SHAFT

John B. Thomson, Manhasset, N.Y., assignor to Thomson Industries, Inc., Manhasset, N.Y.

Filed Jan. 19, 1973, Ser. No. 325,042
Int. Cl. F16c 17/00
U.S. Cl. 308—6 C 33 Claims



1. A linear motion ball bearing for axial movement along a shaft and which has at least one raceway formed in an inner retainer, said raceway having a load bearing portion and a load free portion and substantially filled with balls and a load-carrying plate provided in said load bearing portion of said raceway, characterized in that, means are provided for mounting said load-carrying plate in said load bearing portion of said raceway so that said load-carrying plate is adapted to be mov-

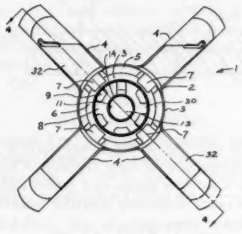
able within the inner ball retainer in directions circumferentially of the shaft on which said bearing is to be mounted.

3,900,234

DIE CAST SUPPORT HAVING NO EFFECTIVE DRAFT

Joseph T. Roddy, Ballwin, and Russell D. Begley, Florissant, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 30, 1973, Ser. No. 355,788
Int. Cl.[2] F16C *13/02*
U.S. Cl. 308—15 14 Claims



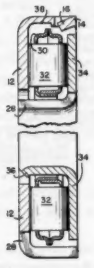
1. In a die cast bearing support including a hub portion intended to receive a second structure having a longitudinal length in a press fit, the improvement comprising a housing in said hub portion having an axial opening in it for receiving said second structure, said opening having a longitudinal axis, said opening being defined by a wall having a plurality of protrusions extending radially inwardly from said wall, the radially innermost part of each of said protrusions being approximately parallel to said longitudinal axis for a length at least equal to the longitudinal length of said second structure.

3,900,235

TAB RACE

Richard L. Alling, and Roger L. Iffland, both of Torrington, Conn., assignors to The Torrington Company, Torrington, Conn.

Continuation-in-part of Ser. No. 214,260, Dec. 10, 1971, Pat. No. 3,713,713, and a continuation of Ser. No. 304,961, Nov. 1, 1972, abandoned. This application Mar. 4, 1974, Ser. No. 448,006
Int. Cl.[2] F16C *33/58*
U.S. Cl. 308—235 6 Claims



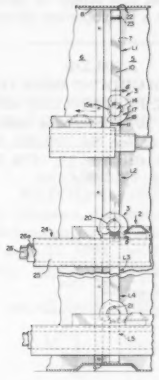
1. A bearing race comprising:
a radially extending portion;
a flange integral with and projecting axially from the outer diameter of the radially extending portion; and at least one tab projecting from the flange inwardly and axially toward the axis of the radially extending portion said flange being provided with a relief hole adjacent to and behind each tab.

3,900,236

FILE INTERLOCK

Gabriel J. Goulish; Leo Terlecki, and Alan R. Wright, all of Youngstown, Ohio, assignors to GF Business Equipment, Inc., Youngstown, Ohio

Filed June 28, 1974, Ser. No. 484,250
Int. Cl.[2] E05B *65/46*
U.S. Cl. 312—217 15 Claims



1. A file cabinet having a plurality of vertically stacked storage elements provided with interlock means for preventing the opening of more than one said element at a time, said interlock means including, a plurality of vertically aligned lock bars in said cabinet for limited vertical displacement therein, guide means in said cabinet containing said lock bars and defining the limit of vertical displacement of said lock bars, cam means carried by each said lock bar each having rotatable lesser and greater diameter portions, said lesser diameter portions normally disposed immediately adjacent the next lower one of said lock bars, means mounting each said storage element within said cabinet for substantially horizontal rectilinear movement therein, activator means horizontally movable concurrently with each said storage element to engage one said cam means to vertically displace its respective lock bar and concurrently rotate said cam means whereby, when one said cam means has been rotated by said activator means and its respective lock bar elevated thereby, all remaining said lock bars and cam members are immobilized and block movement of any additional activator means and associated storage elements therepast.

3,900,237

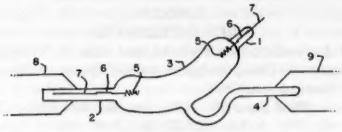
METHOD OF MAKING ARCH SHAPED ARC TUBE

Rudoph Marcucci, Beverly, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Aug. 9, 1973, Ser. No. 386,868
Int. Cl. H01j *9/38*
U.S. Cl. 316—20 3 Claims

1. In the manufacture of an arc tube for a high intensity arc discharge lamp, the steps which comprise: joining two lengths of quartz tubing to the ends of a larger diameter cylindrical quartz tube; bending the cylindrical quartz tube into an arch shape; forming an opening in the wall of the arch tube, said opening being substantially at the longitudinal center of the arch tube; joining an exhaust tube to the arch tube in alignment with said opening; bending the exhaust tube into axial alignment with one of the lengths of tubing; sealing the open

end of said exhaust tube and the open end of the other length of tubing; inserting an electrode assembly including a molybdenum ribbon into said one length of tubing and vacuum sealing the tubing onto a molybdenum ribbon.



3,900,238

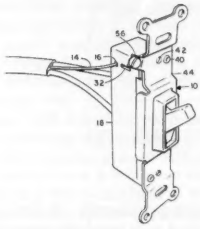
ADDITION OF A STAB GROUND WIRE TO ELECTRICAL RECEPTACLES, I.E. SWITCHES AND PLUGS

Raymond G. Anderson, 206 N. Sharmin, Ankeny, Iowa 50021

Continuation-in-part of Ser. No. 290,080, Sept. 18, 1972, abandoned. This application Apr. 15, 1974, Ser. No. 460,769

Int. Cl. H01r *3/06*

U.S. Cl. 339—14 R **4 Claims**



1. An electrical outlet receptacle comprising,
an insulated housing having wall portions forming a chamber for holding power terminals and a ground terminal therewithin,
an electrical cover means for said housing,
at least two power wire terminals mounted within said housing chamber, and
a quick wiring ground terminal arranged to receive a ground wire and grip the same which is comprised of,
an integral metallic ground conductor mounted on one wall of said housing and having an extension portion extending across an immediately adjacent wall and opposite said one wall said ground conductor having a wire receiving channel, and said extension portion which extends across said immediately adjacent wall having a deflectable arm with a ground wire gripping lower edge which partially obstructs said ground wire receiving channel, said housing having a ground wire access aperture aligned with said channel, and a tool access aperture aligned with said deflectable arm for insertion of a tool to deflect said arm and release a ground wire.

3,900,239

ELECTRICAL SOCKET ADAPTOR

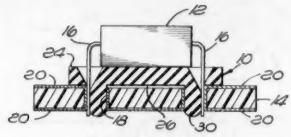
John William Anhalt, and David Samuel Goodman, both of Orange, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 4, 1973, Ser. No. 394,355

Int. Cl. H05k *1/07*

U.S. Cl. 339—17 CF **4 Claims**

1. An electrical socket adaptor for interconnecting an electrical circuit element having electrical leads extending therefrom with a mounting member having plated-through holes therein, comprising:
a body of resilient insulative material having an upper surface and a lower surface;
a plurality of apertures in said body opening at said upper surface thereof and arranged in a pattern corresponding to the arrangement of said electrical circuit element leads;
a plurality of integral resilient hubs on said body extending downwardly from said lower surface thereof, each said hub being positioned in juxtaposition to a respective one of said apertures and being adapted to be resiliently mounted in one of said plated-through holes; and



said apertures opening at the lower surface of said body adjacent to one side of their respective hubs, each said hub having a portion positioned below and spaced from the bottom of its respective aperture whereby, when said socket adaptor interconnects said electrical circuit element and said mounting member, the electrical circuit element leads extending downwardly through said apertures will be biased against the walls of said plated-through holes by said resilient hubs, each said aperture including a pair of inclined side walls converging downwardly toward said lower surface of said body, said planes of said side walls intersecting below said lower surface.

3,900,240

SKIRTING BOARD

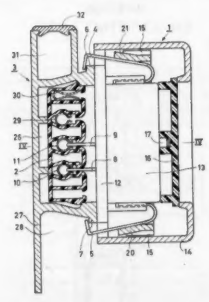
Johannes Kurt Bertrams, deceased, late of Hilden, Germany, by Casper Antonius Henricus Mulkens, administrator, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,113

Claims priority, application Netherlands, Dec. 16, 1972, 7217178

Int. Cl. H01r *9/00*

U.S. Cl. 339—21 R **3 Claims**



1. A current adapter for connecting and holding an electrical socket to a current rail, comprising a housing having a bottom portion and an upper portion, two coupling members connected to said lower portion for movement between an unclamped position and a clamping position for clamping under an edge portion of the current rail, a movable member within said housing movable between first and second extreme positions, means for moving said coupling members from said unclamped position to said clamping position responsive to

movement of said movable member from said second to said first extreme positions and for returning said coupling members to said unclamped position upon movement of said movable member to said second position, means for making electrical contact with a conductor in said voltage rail, socket means for connecting a current-consuming unit to the adapter, a safety disc connected to said upper portion and covering said socket means, movable between a locked position and an operating position, said disc having at least one hole aligned with said socket means only when said disc is in said operating position, and means for permitting movement of said disc from said locked position only when said movable member is in said first extreme position and for permitting movement of said movable member from said first extreme position only when said disc is in said locked position, whereby said adapter cannot be removed from the voltage rail while a plug is inserted in the socket means.

3,900,241

WIRING HARNESS

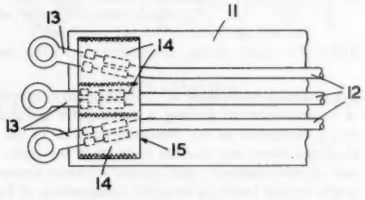
William Lawrence Fry, Stafford, England, assignor to Rist's Wires & Cables Limited, Birmingham, England

Filed Jan. 31, 1974, Ser. No. 438,279

Claims priority, application United Kingdom, Feb. 14, 1973, 7171/73

Int. Cl.[2] H01R *11/04*

U.S. Cl. 339—59 M **5 Claims**



1. A wiring harness including a thermoplastic backing strip, at least one conductive lead including a conductive core in a thermoplastic sheath, said sheath being fused to the backing strip to secure the lead to the backing strip, a terminal electrically connected to one end of the core of the lead, and a thermoplastic sleeve within which said terminal is received, said sleeve being fused to said backing strip to locate the terminal in a predetermined position on said backing strip.

3,900,242

ELECTRICAL CONNECTION OF FLEXIBLE PRINTED CIRCUITS

Peter Francis Maheux, Arnprior, and Brian Matthew Deacon, Ottawa, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed July 17, 1974, Ser. No. 489,175

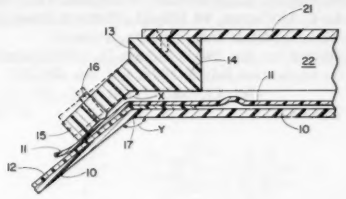
Int. Cl.[2] H01R *13/38*

U.S. Cl. 339—95 R **3 Claims**

1. A method of electrically connecting two flexible printed circuits, each circuit having at least one conductor thereon, comprising:

positioning the two circuits with the conductors in contact between two clamping members having opposing cooperating surfaces, the surface of one member being slightly out of parallelism with the surface of the other member; positioning a pin to project through the said surface of the one member for each opposed pair of conductors in the flexible circuits;

and moving the clamping members into clamping relationship to distort said surface of said one member substantially into parallelism with the surface of said other member and swinging said pins in a plane normal to the planes of the conductors to urge said conductors into direct



intimate connection and to cause a wiping motion between said conductors as the connection is made.

3,900,243

WATCHING MIRROR

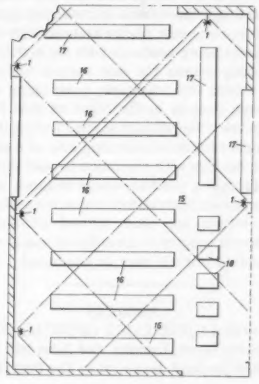
Berndt-Ola Folke Johnsson, Linkoping, Sweden, assignor to Moderna Butiksinredningar AB, Molndal, Sweden

Filed June 21, 1974, Ser. No. 481,707

Claims priority, application Sweden, June 25, 1973, 7308903

Int. Cl. G02b *27/17, 5/08*

U.S. Cl. 350—6 **1 Claim**



1. In building builing having a station for supervisory personnel and regions remote from said station which cannot be directly observed from said station, a plurality of mirror members positioned in the line of sight from said station, each mirror member comprising a mounting base, a mirror and means for rotatably attaching said mirror to said base for rotation about a substantially vertical axis, a drive motor and a crank arm rotatably driven thereby, and link means connecting said crank arm to said mirror in offset relation to said axis for continuously oscillating said mirror about said axis over an angular deviation sufficient to allow observation of all of said remote regions by means of said mirrors at some times, whereby a person in a remote region is uncertain when he is under observation thereby to broaden the supervisional field and deter shoplifting.

3,900,244

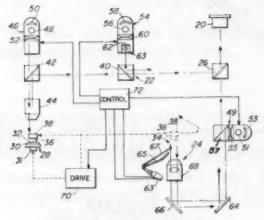
VISUAL SELECTION AND PRECISION ISOLATION SYSTEM FOR MICROELECTRONIC UNITS

Mordechai Wiesler, 6 Carmel Cir., Lexington, Mass. 02173, and John C. McCarron, 9A Ellis Ct., Woburn, Mass. 01801, assignors to Teledyne, Inc., Woburn, Mass.

Continuation of Ser. No. 290,968, Sept. 21, 1972, abandoned. This application July 5, 1974, Ser. No. 486,217

Int. Cl. G02b 21/20

U.S. Cl. 350—81 17 Claims



1. An optical system for visually selecting and precisely locating microelectronic units, said optical system comprising first optical means including first imaging means having a first pair of conjugate planes in a first optical path, second optical means including second imaging means having a second pair of conjugate planes in a second optical path, observation means visually communicating with one of said first conjugate planes and one of said second conjugate planes, third optical means for projecting a reticle image, beam splitting means for superposing said reticle image onto said one of said first conjugate planes and said one of said second conjugate planes, said one of said first conjugate planes and said one of said second conjugate planes being coplanar with the reticle image plane, first illuminating means for said second optical path, first mechanical means for adjustably positioning a plurality of microelectronic devices in the other of said first conjugate planes and in the other of said second conjugate planes, second mechanical means for selecting one of a plurality of microelectronic devices with reference to said reticle image for movement through a predetermined distance with reference to said reticle image, and control means for switching said first illuminating means and said second illuminating means, whereby different aspects of a particular microelectronic unit optically centered initially may be examined.

3,900,245

COUPLER FOR LIQUID CORE OPTICAL WAVEGUIDES

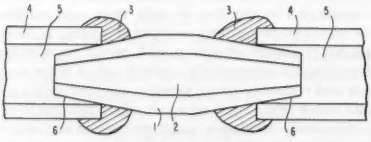
Richard Burnaby Dyott, London, and John Hill Stewart, Stanmore, both of England, assignors to The Post Office, London, England

Filed Aug. 24, 1973, Ser. No. 391,360

Claims priority, application United Kingdom, Sept. 6, 1972, 41240/72

Int. Cl. G02b 5/14

U.S. Cl. 350—96 C 8 Claims



1. A dielectric optical waveguide coupling including first, second and third lengths of dielectric optical waveguide, said first length having a solid cladding and core, a central cylindrical portion and oppositely tapered end portions, said second and third lengths each having a liquid core and a solid cladding, said lengths being disposed in axial alignment with each other and with said first length between the other two and the tapered portions of said first length being disposed partially within the liquid cores of said second and third lengths, said second length having a Pyrex cladding and a bromotrichlormethane core, said first length having a cladding consisting of Schott glass FK1 and a core selected from the group consisting of Schott glass 2KN7 and PK1, and said third length having a Pyrex cladding and a core selected from the group consisting of bromotrichlormethane and tetrachloroethylene.

3,900,246

LANTHANUM TITANATE SINGLE CRYSTAL ELECTROPTIC MODULATOR

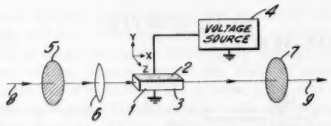
Masakazu Kimura; Satoshi Nanamatsu; Kikuo Doi, and Shigeo Matsushita, all of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 251,156, May 8, 1972, abandoned. This application Feb. 25, 1974, Ser. No. 445,349

Claims priority, application Japan, May 24, 1971, 46-35763

Int. Cl.[2] G02F 1/26

U.S. Cl. 350—150 2 Claims



1. An intensity modulator for a light beam comprising:

a. a crystal element having a rectangular parallelepiped shape elongated in the direction parallel to the natural cleavage plane and normal to both of the optic axes of said crystal element, said crystal element comprising a single crystal having a nominal composition of $La_2Ti_2O_7$;

b. first and second light polarizers having polarization directions at right angles,

c. means for impressing an electric field across said crystal element in a direction parallel to said natural cleavage plane and parallel to a plane containing both of said optic axes of said crystal element;

wherein a light beam is transmitted through said first polarizer, said crystal element and said second polarizer in succession in said direction parallel to said natural cleavage plane and normal to both of said optic axes of said crystal element, and the intensity of said light beam is modified by the linear electro-optic effect of said crystal element.

3,900,247

OPTICAL MODULATOR HAVING COMPENSATION FOR THERMAL AND SPACE CHARGE EFFECTS

Safwat George Zaky, Oakville, Canada, assignor to Northern Electric Company Limited, Montreal, Canada

Filed Feb. 26, 1974, Ser. No. 445,875

Int. Cl.[2] G02F 1/03

U.S. Cl. 350—150 2 Claims

1. In an optical modulator for connection to a source of linearly polarized light, comprising in tandem connected optical combination;

a beam splitter for splitting the linearly polarized light which is reentrant from that which is incident thereupon;

a mirror; and

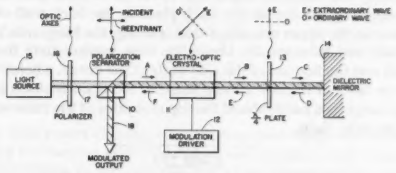
a variable birefringent device located between the beam splitter and the mirror;

the improvement comprising:

a quarter-wave plate located between the variable birefringent device and the mirror;

the optical axis of the birefringent device being at an angle of $\pi/4$ radians with respect to that of the source of lin-

early polarized light and the quarter-wave plate, and the total optical transmission time from the variable birefringent device through the quarter-wave plate to the mirror and back again being at least as great as the time required to change the birefringence of said device;



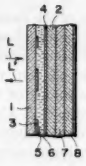
whereby the relative phase shift, of the ordinary and extraordinary components of the polarized light in said modulator is substantially a result of only said change in birefringence of said device.

3,900,248

LIQUID CRYSTAL DISPLAY DEVICE

Osamu Nagasaki, Narashino, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Japan

Filed Sept. 11, 1973, Ser. No. 396,310
Claims priority, application Japan, Sept. 11, 1972, 47-90351
Int. Cl. G02f 1/16
U.S. Cl. 350—160 LC 9 Claims



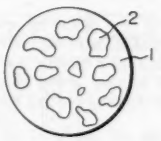
1. A high contrast liquid crystal optical image display device comprising a light source, means defining at least one cavity for containing liquid crystal compositions, comprising at least one pair of spaced apart parallel plates, each pair defining one cavity therebetween; a liquid crystal composition in each cavity, said composition containing a dichroic substance which absorbs a component of the light having an electric vector in a given direction when the substance is aligned parallel to said plates and transmits light without absorbtion when said dichroic substance is aligned perpendicular to said plate, said cavity being illuminated by said light source and at least one of said plates in each pair being light transmitting; each of said plates having transparent electric field-generating electrode means adjacent to said cavity; at least one of said electrode means being segmented into character forming elements; means for selectively imposing electric fields in individual segments; and retardation plate means for changing the electric vector of said light after initial passage through said liquid crystal cavity whereby causing said light to make a second passage through said liquid crystal cavity such that when said dichroic substance is aligned parallel to the plate, one electric vector of said incident light is absorbed during said initial passage and the othogonal electric vector component is absorbed during said second passage.

3,900,249

SOFT-FOCUS OPTICAL ELEMENT

Teruyoshi Tsunashima, Kawasaki; Teruo Kaneko, and Takeo Ichimura, both of Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed May 9, 1973, Ser. No. 358,466
Claims priority, application Japan, May 15, 1972, 47-47154
Int. Cl. G02b 13/20
U.S. Cl. 350—188 7 Claims



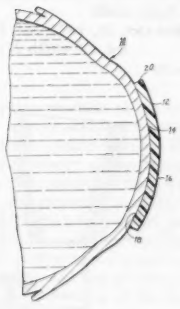
1. A soft-focus optical element comprising a transparent substrate of a predetermined refractive index, and an almost infinite number of micro-and indefinite shaped ion-penetrated portions formed in said transparent substrate in accordance with a desired pattern preformed on said transparent substrate, said ion-penetrated portions having a refractive index different from that of the rest of said transparent substrate.

3,900,250

SEMI-RIGID, GAS PERMEABLE CONTACT LENSES

Edward J. Ivani, Brooklyn, N.Y., assignor to Rynco Scientific Corporation, Floral Park, N.Y.

Filed Oct. 26, 1973, Ser. No. 410,255
Int. Cl.[2] G02C 7/04
U.S. Cl. 351—160 1 Claim



1. A semi-rigid, gas-permeable contact lens of generally concave-convex cross-section having the concave surface thereof substantially conforming to the cornea of the eye, said lens being formed of transparent, optically clear cellulose acetate butyrate.

3,900,251

SYNCHRONIZER SYSTEM FOR A MOTION PICTURE SOUND RECORDER

Robert O. Doyle; Jordan Kirsch, both of Cambridge, Mass., and Wendl Thomis, Fort Lee, N.J., assignors to Super 8 Sound, Inc., Cambridge, Mass.

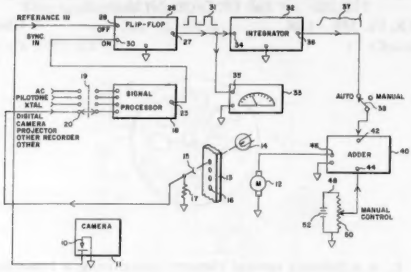
Filed Mar. 29, 1974, Ser. No. 456,035
Int. Cl. G03b 31/00
U.S. Cl. 352—12 13 Claims

1. A synchronizer for a motion picture sound recorder comprising:

means for generating sync signals representative of film advancement of motion picture film;

sound synchronizing means for supplying reference signals representative of the sound recording rate;

means coupled to said sound synchronizing means and said means for generating said sync signals for generating intermediate control pulses having a duration representative of the phase difference between the sync and reference signals;



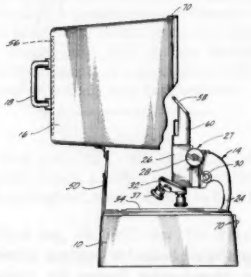
means for converting said pulses to a d-c control signal, the amplitude of which is a function of the duration of the intermediate control pulses; and

d-c drive means for controlling the sound recorder drive rate, said d-c drive means being coupled to said d-c control voltage and at least partially energized thereby.

3,900,252
METHOD AND APPARATUS FOR ANALYZING HAIR STRUCTURE

Ronald M. Di Salvo, Marina Del Rey, and Robert W. Yates, Woodland Hills, both of Calif., assignors to RedKen Laboratories, Van Nuys, Calif.

Filed Oct. 31, 1973, Ser. No. 411,188
Int. Cl. G02b *21/36*
U.S. Cl. 353—39 **2 Claims**

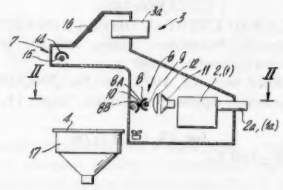


1. A projection microscope comprising a base, a light source mounted in the base, a microscope mounted on top of the base, the microscope having a vertically extending optical system with an eyepiece at the top, means directing light from the source to illuminate a sample positioned below the microscope and through the optical system of the microscope, means including a mirror mounted on the top of the microscope directing the light from the image formed by the microscope from a vertical to a horizontal path, a rigid cover fitting over the microscope and having walls surrounding the microscope on three sides and the back, the walls extending upwardly from the base to a top wall extending above the microscope when the cover is closed, the cover having a projection screen mounted inside the top wall of the cover, and hinge means connecting the wall at the back of the cover to the base, the cover being tiltable to an open position with the screen positioned vertically, the mirror directing light from the eyepiece onto the screen with the cover in the open position, the hinge means including a back plate secured to the base and extending upwardly above the base, the back wall of the cover having an opening for receiving the back plate, the back plate closing the opening when the cover is closed, and hinges connecting the top of the back plate to the back wall of the cover at the upper margin of said opening, the hinge axis being positioned substantially above the base intermediate the top wall and the bottom of the side walls of the cover, whereby the three sides of the cover when tilted to the open position about the hinge axis partly shield the top and sides of the microscope from stray light.

3,900,253
OPTICAL PROJECTING APPARATUS

Jan-Erik Asterö, Tumba, Sweden, assignor to Lindaco Ltd., Geneva, Switzerland

Filed Apr. 20, 1973, Ser. No. 353,202
Claims priority, application Sweden, Apr. 26, 1972, 5521/72; July 3, 1972, 8743/72; Sept. 12, 1972, 11778/72
Int. Cl. G03b *21/08, 21/20, 21/00*
U.S. Cl. 353—63 **11 Claims**



1. Projection apparatus of the overhead type, comprising: a TV-set, the picture tube surface of which is arranged horizontally; a mirror positioned above said picture tube surface for deflecting light from said picture tube surface, and a lens system for projecting the image of the picture tube surface, support means for mounting said TV-set, said support means at its top side being provided with a sheet of transparent material, light means for illuminating said sheet from a position above said surface, whereby said projection apparatus is a combined overhead and episcopic projector which functions to project an image from said picture tube by directing light orginating from said picture tube to said mirror and reflecting it thereby through said lens system; to project an image from a full size transparency placed on said transparent material by directing light originating from said picture tube through said transparency and to said mirror where it is reflected through said lens system; and to project an image from an opaque picture placed on said sheet of transparent material by directing light originating from said light means to said opaque picture and thence to said mirror where it is reflected through said lens system.

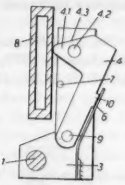
3,900,254
STILL PICTURE PROJECTOR

Wolfgang Apel, Dresden, Germany, assignor to VEB Pentacon, Dresden, Germany

Filed Mar. 25, 1974, Ser. No. 454,442
Int. Cl. G03b *21/00*
U.S. Cl. 353—68 **7 Claims**

1. In a still picture projector having a housing, a light path within said housing, means defining an aperture within said housing in the light path, a first opening in the housing whereby an image carrier is movable into the aperture and a second opening in the housing whereby an image carrier is movable into the aperture, the provision of:

a. means for moving an image carrier in the form of slide into said aperture via said first opening, and



b. a slide return element movably mounted within the housing for moving said slide out of said aperture, and means responsive to the introduction of an image carrier into said aperture via said second opening, to move the slide return element away from the aperture.

3,900,255

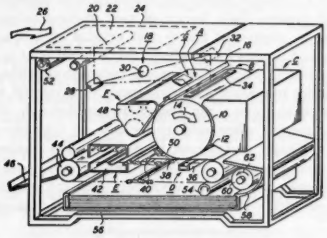
PADDLE-WHEEL DEVELOPMENT SYSTEM

Kazunobu Yamamoto, Akasaka, Japan, assignor to Rank Xerox Ltd., London, England

Division of Ser. No. 269,903, July 7, 1972. This application Feb. 27, 1974, Ser. No. 446,584

Int. Cl. G03g *15/00*

U.S. Cl. 355—3 DD **2 Claims**



1. An electrophotographic printing machine, including:

a photoconductive member;

corona generating means for charging said photoconductive member to a substantially uniform level;

exposure means for producing a light image which irradiates said photoconductive member to selectively discharge portions thereof recording an electrostatic latent image thereon of an original document to be reproduced;

a housing member storing a supply of developer mix comprising carrier granules and toner particles;

a hub member mounted rotatably in said housing member; a plurality of substantially equally spaced longitudinally extending vanes mounted fixedly on the circumferential surface of said hub member;

drive means for rotating said hub member to form a flow of developer mix moving from a first region below said hub member to a second region above said hub member;

a deflection plate disposed above said hub member and within said deflection plate having an undersurface extending transversely to said photoconductive member for intercepting and directing the flow of developer mix impacting thereon towards the electrostatic latent image recorded on said photoconductive member;

a control plate having opposed end portions, said control plate being disposed in closely spaced relation to said photoconductive member with one end portion in an adjacent spaced relation to the portion of the undersurface of said deflection plate closest to said photoconductive member such that the developer mix directed by the undersurface of said deflection plate towards said photoconductive member cascades within the space defined by the control plate and the photoconductive member and over the electrostatic latent image recorded on said photoconductive member; and

a recovery plate disposed adjacent the end portion of said control plate opposed from the undersurface of said deflection plate and arranged to direct the flow of unused developer mix and carrier granules into the first region of said housing member for subsequent re-use.

3,900,256

ELECTROSTATIC COPYING MACHINE AND SYNCHRONIZING CONTROL SYSTEM THEREFOR

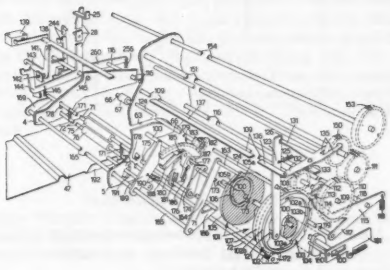
Giovanni Ravera; Giorgio Siletto, both of Turin, and Carlo Bellis, Strambino, all of Italy, assignors to Ing. C. Olivette & C., S.p.A., Turin, Italy

Filed June 21, 1974, Ser. No. 481,941

Claims priority, application Italy, July 9, 1973, 69035/73

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—14 **9 Claims**



1. An electrostatic copying machine of the type having a motor, a first transport system actuated by the motor for transporting an original along a scanning zone past an illuminating system, a second transport system actuated by the motor for transporting a copy sheet fed from a feed station through a corona-effect electrostatic charging device and through an exposure zone at which an image of the original is formed by an optical system, means for synchronizing the movement of the said first and second transport systems and for co-ordinating the actuation of the charging device and illuminating system with the movement of the first transport system, said means comprising in combination:

a first cam actuated by the motor,

a second cam integral with said first cam and movable therewith,

a third can integral with said second cam and movable therewith,

a clutch device movable into a first operative position of transmission of the motion from the motor to said first cam and into a second position of non-transmission of the motion from the motor to said first cam,

a key for effecting the movement of said clutch device into its first operative position and for switching on the corona changing device,

means actuated by said first cam for transmitting the motion from the motor to the first transport system and for activating the illuminating system,

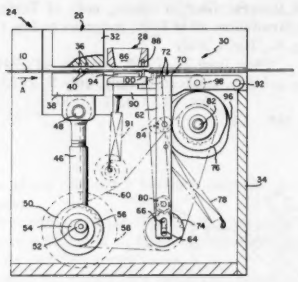
means actuated by said second cam for feeding the copy sheet to the second transport system; and

means actuated by said third cam for causing said clutch device to move into its second position.

3,900,257
REGISTRATION DEVICE FOR PRINTED CIRCUITS

Harold Oakley Woolley, Jr., Hershey, and Bernard Groene Ryle, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 357,050, May 3, 1973, abandoned. This application Jan. 21, 1974, Ser. No. 435,144
Int. Cl.[2] G03B 27/42
U.S. Cl. 355—29 16 Claims



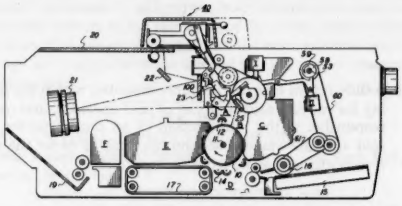
1. A device for printing a predetermined pattern on a web having perforations formed therein in predetermined spaced locations, said device including:

a printing station, means at said printing station for sequentially printing said predetermined pattern on said web, spaced recesses formed in said printing means located in predetermined spaced relation to the pattern to be printed thereby, clamping means movably mounted in said device on the opposite side of said web from said printing means, means for moving said clamping means into and out of engagement with said printing means during each printing operation, said clamping means including pins extending therefrom towards said recesses in said printing means, said pins, perforations and recesses all having a complementary configuration in plan, said pins passing through perforations in said web into said recesses, as said moving means moves said clamping means into engagement with the web, whereby the perforations receiving said pins are located in alignment with said recesses and positioned in a predetermined relation with respect to the pattern being printed on the web; and means for advancing said web through said printing station a predetermined distance between each printing operation comprising at least one advancing head movably mounted in said device downstream of said printing station in the direction of travel of the web, said advancing head having at least one tooth extending therefrom in position to selectively engage perforations in said web, and means for moving said advancing head in a generally D-shaped path of travel wherein at an initial position said teeth engage perforations in the web after a printing operation and are moved away from the printing station for a predetermined distance at the end of which the teeth are disengaged from said perforations and the heads are returned, out of engagement with the web, toward the printing station, during the printing operation, to said initial position, whereby said web is advanced in a stepwise manner over a predetermined distance between printing operations.

3,900,258
EXPOSURE APPARATUS

Werner F. Hoppner, Webster, and David K. Shogren, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 284,687, Aug. 29, 1972, abandoned. This application June 7, 1973, Ser. No. 367,996
Int. Cl.[2] G03B 27/46; G03G 15/04
U.S. Cl. 355—51 16 Claims

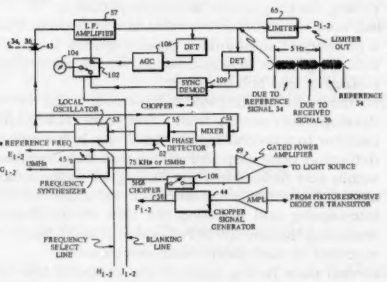


10. A reproducing apparatus comprising means for providing a flowing light image of a stationary original supported upon a stationary viewing platen in a first mode of operation and for providing a flowing light image of a moving original in a second mode of operation and means for selecting between said first mode of operation and said second mode of operation, said flowing light image of said stationary original being provided by optical means for scanning said stationary original, said flowing light image of said moving original being provided by means of fixing said optical means at a given position and means for feeding said original over said platen past said fixed optics, said feeding means comprising a document feeder including a feeding member arranged to engage said platen to form a nip therebetween through which said originals are fed when said feeder is in an operative position over said platen and means to move said document feeder from a stored position off said platen to said operative position, whereby documents advanced over the platen by said feeder are within the viewing domain of said optical means.

3,900,259
TIME INTERVAL PHASE DETECTION IN DISTANCE MEASURING APPARATUS

Claude M. Mott, and Richard J. Clark, both of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 9, 1973, Ser. No. 358,771
Int. Cl. G01c 3/08
U.S. Cl. 356—5 4 Claims



1. Electro-optical distance measuring apparatus of the type including a modulated target path light signal transmitted to and reflected back from a distant target, and an internal reference path light signal continuously and cyclically time multi-

plexed therewith to provide a time multiplexed signal of fixed frequency having alternating target path and reference path portions, wherein the improvement comprises:

detecting means for separately determining the beginning of a target path portion of said time multiplexed signal and an immediately succeeding reference path portion thereof, and for providing a plurality of pulses, during each of those target path and reference path portions, the number of such pulses being proportional to the phase difference between the reference frequency signal and the respective portions of said time multiplexed signal;

accumulator means connected to said detecting means for separately receiving and counting the plurality of pulses provided by said detecting means during those target path and reference path portions of said time multiplexed signal; and

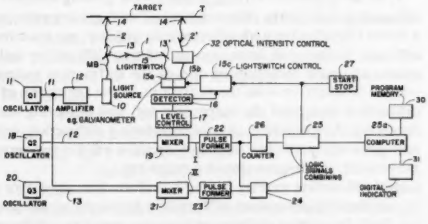
logic means for combining the counted results of the accumulator means obtained during those target path and reference path portions of said time multiplexed signal to provide an intermediate indication of the phase difference between said target path light signal and said internal reference path light signal, said logic means being operative for enabling said detecting means to repeatedly sample said time multiplexed signal to provide a plurality of pulses, during subsequent target path and immediately succeeding reference path portions thereof, the number of pulses provided during each sample again being proportional to the phase difference between the reference frequency signal and the respective portions of said time multiplexed signal, said logic means being operative to enable said accumulator means to separately receive and count the plurality of pulses provided by said detection means during each of the target and reference path portions of said time multiplexed signal occurring in connection with each such repeated sample, said logic means being operative for combining the counted results of the accumulator means obtained during each of the target and reference path portions of said time multiplexed signal occurring in connection with each such repeated sample to provide a plurality of intermediate indications of the phase difference between said target path light signal and said internal reference path light signal, said logic means being operative for computing the statistical variance of the plurality of intermediate indications of phase difference and for comparing that computed statistical variance with a predetermined test limit to insure a specified degree of measurement accuracy.

3,900,260

METHOD AND APPARATUS FOR MEASURING THE DISTANCE AND/OR RELATIVE ELEVATION BETWEEN TWO POINTS IN AN OPTO-ELECTRONIC MANNER

Gerhard Wendt, Kulmbach, Germany, assignor to MITEC Moderne Industrietechnik GmbH, Frieding-Herrsching, Germany

Filed Jan. 23, 1974, Ser. No. 435,936
Int. Cl. G01c *3/08*; **G01b** *11/26*
U.S. Cl. 356—5 **26 Claims**



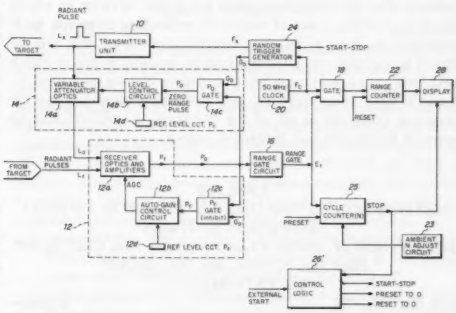
1. An opto-electronic apparatus for the measuring of the distance (x or y) between a measuring point (M) and a target (T), comprising: light source means (**10**) located at said measuring point (M), first signal generating means (**11, 12**) for producing a first frequency signal ($f1$) operatively connected to said light source (**10**) for modulating a light beam produced by said light source (D), optical means (**50, . . .**) operatively arranged to divide said modulated light beam (MB) into a measuring beam (**2**) and into a reference beam (**1**), said target (T) including retro-reflecting means (**14**) located to receive said measuring beam (**2**) and to return a reflected beam (**2'**), light switching means (**15***a*, **15***b*) located to receive said reference beam (**1**) and said reflected beam (**2'**), switch control means (**15***c*) operatively connected to said light switching means (**15***a*, **15***b*) for alternating actuation of said light switching means (**15***a*, **15***b*), a first signal channel (I) comprising a first signal mixing stage (**19**) and second signal generating means (**18**) for producing a second frequency signal ($f2$), said first mixing stage being connected to receive a signal from said detector means (**16**) and said second frequency signal to produce a first intermediate frequency signal, a second signal channel (II) comprising a second signal mixing stage (**21**), and a third signal generating means (**20**) for producing a third frequency signal ($f3$), said second signal mixing stage (**21**) being connected to receive said first frequency signal ($f1$) and said third frequency signal ($f3$) to produce a second intermediate frequency signal, and signal evaluating means (**22, 23**) having inputs connected to said first and second signal channels (I, II) respectively, logic circuit means (**24, 26**), said signal evaluating means having outputs connected to said logic circuit means (**24, 26**) and computing means (**25***a*) connected to said logic circuit means (**25, 26**) for computing said distance.

3,900,261

ELECTRONIC RANGE FINDER

Sidney Wingate, Concord, Mass., assignor to Transitek Corporation, Concord, Mass.

Filed Mar. 18, 1974, Ser. No. 452,049
Int. Cl.² G01C *3/08*
U.S. Cl. 356—5 **18 Claims**



1. A high resolution electronic range finder comprising:

a transmitter unit for generating a first pulse of radiation and transmitting it to a target whose range is to be determined;

a single channel receiver unit for receiving said first pulse of radiation after it is reflected from the target and producing a counterpart first signal pulse;

an automatic gain control unit, responsive to said first signal pulse, for providing a control signal to said receiver unit to maintain said first signal pulse at a predetermined reference level;

a variable attenuation system responsive to said first pulse of radiation at said transmitter unit for producing a second pulse of radiation having the same level that said first pulse of radiation has at said receiving unit; said receiver in response to said second pulse of radiation producing a counterpart second signal pulse;

a clock pulse source;

a range determining circuit responsive to said first and second signal pulses to count, during the interval defined by said first and second signal pulses, clock pulses from said clock pulse source as a representation of the range to the target; and

a trigger generator for providing a trigger signal to said transmitter unit to enable it to generate said first pulse of radiation, said trigger signal having a frequency which is a sub-multiple of the frequency of said clock pulse source.

3,900,262

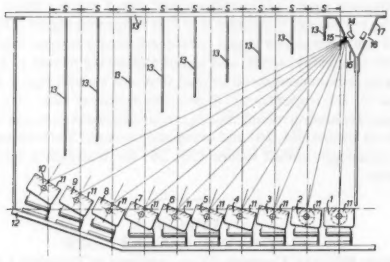
OPTICAL VELOCITY MEASURING APPARATUS

Ivor Renton Baxter, Brentwood, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Oct. 25, 1972, Ser. No. 300,814

Int. Cl.² G01P 3/36

U.S. Cl. 356—28 **7 Claims**



1. An apparatus for optically measuring the velocity along a particular line of travel of a moving object and providing therefrom an electrical output which includes a spectral component of modulation dependent upon said velocity in which there is provided a set of elemental reflecting elements each arranged to view a different spaced portion of said line of travel to provide an effective optical grating in space along said line and a common photo-sensitive device arranged to receive light from each of said reflecting elements via an aperture common to all of the elements in said set and to provide therefrom said electrical output.

3,900,263

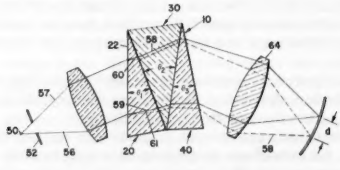
METHOD FOR MINIMIZING DEVIATION IN OPTICAL DISPERSION SYSTEMS

Joseph F. Hall, Jr., 1052 La Limonar, Santa Ana, Calif. 92705

Filed Jan. 4, 1974, Ser. No. 430,847

Int. Cl.² G01J 3/12

U.S. Cl. 356—74 **1 Claim**



1. The method of designing a prism set for dispersing light such that components differing in wave length are physically separated, which comprises the steps of:

algebraically adding at least three equations, each of which expresses deviation in a prism and which can be reduced to the form:

$$\delta = \left(n_0 + \frac{A}{\lambda 2} + \frac{B}{\lambda 4}\right)\Theta$$

such that together said equations express resultant deviation through three prisms arranged so that the sum of the deviation through two of them is diminished by deviation through the third to produce an expression for resultant deviation;

recording the known range of values of the terms n_0, A, and B that can be achieved in a single prism by selection of the materials from which a prism may be made;

computing values of θ, n_0, A and B in each of the equations that form said expression that would cause said expression to describe a locus of points on a graph of deviation versus wave length that crosses a straight line at not less than four points;

constructing at least three prisms, each having a prism angle and composition corresponding to a respectively associated one of said three equations; and

associating said three prisms such that light can pass through them in series such that deviation is added upon light passing through the first and third of said three prisms and is diminished upon said light passing through the second of said three prisms.

3,900,264

ELECTRO-OPTICAL STEP MARKER

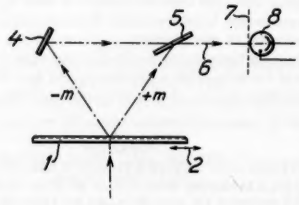
Knut Heitmann, and Eckart Schneider, both of Wetzlar, Germany, assignors to Ernst Leitz G.m.b.H., Wetzlar, Germany

Filed June 19, 1973, Ser. No. 371,473

Claims priority, application Germany, June 20, 1972, 2229996

Int. Cl.² G01B 9/02

U.S. Cl. 356—111 **6 Claims**



1. In an apparatus having a diffraction grating suitable for measuring a property of movement of said grating relative to a beam of radiation with reference to at least one coordinate axis and defining at least one set of two diffraction orders, means to cause radiation of one of the diffraction orders of one set to interfere with the radiations of the other one of the diffraction orders of the respective set, and detecting means receiving the radiation of said interfering diffraction orders and generating electric signals indicative of the property of movement, the improvement comprising:

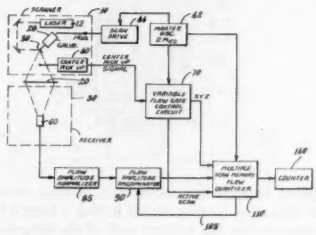
said diffraction grating having a uniform line geometry and a plurality of sections with groove geometry varied irregularly by section defining at least one set of two diffraction orders other than the zero diffraction order and energetically preferred to all the other diffraction orders.

3,900,265

LASER SCANNER FLAW DETECTION SYSTEM

Monty M. Merlen, Stamford, and Peter H. Nichols, Cheshire, both of Conn., assignors to Intec Corporation, Norwalk, Conn.

Filed Mar. 8, 1974, Ser. No. 449,247
Int. Cl.[2] G01N 21/32
U.S. Cl. 356—200 21 Claims



1. A laser scanner flaw detection system for detecting flaws on a surface of material, comprising:

a. a laser for emitting a laser beam of radiation,

b. scanner means for successively scanning said laser beam across a surface of material being examined,

c. receiver means having a field of view and a detector means for receiving radiation applied by said laser beam from said surface to said detector means producing, signals therefrom in response to the radiation applied to said detector means,

d. flaw amplitude discriminator means coupled to said detector means for producing flaw signals therefrom when the signals from said detector means exceed a predetermined level,

e. laser beam position indicating means for producing beam position signals,

f. variable flaw gate control means having said beam position signals coupled thereto for providing variable flaw gate control signals which vary in accordance with the scan position of said laser beam,

g. one-scan delay variable width flaw gate means having said flaw signals from said discriminator and said flaw gate control signals coupled thereto for providing a one-scan delay variable time width flaw gate signals which vary in accordance with the scan position of said laser beam, and

h. flaw quantizer means coupled to said flaw amplitude discriminator and said one-scan delay variable width flaw gate means for passing an output indicative of a flaw on the surface of the material being examined only on the first occurrence of a flaw signal during an active scan interval, and inhibiting subsequent flaws signals occurring during adjacent successive scans which occur during the time intervals of the flaw gates established by said one-scan delay variable width flaw gate means.

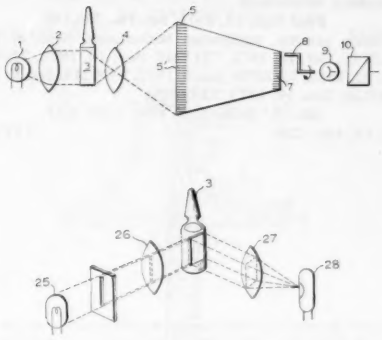
3,900,266

METHOD AND APPARATUS FOR DETECTING SOLID SUBSTANCES CONTAINED IN LIQUID

Toshio Takahashi, Honjo; Ryosaku Tagaya, Isezaki, and Toshiyasu Ehara, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Oct. 25, 1973, Ser. No. 409,368
Claims priority, application Japan, Oct. 31, 1972, 47-108524; May 29, 1973, 48-59379
Int. Cl. G01n 21/06, 21/24
U.S. Cl. 356—208 3 Claims

1. A method for detecting foreign solid matter that might exist as an impurity in a transparent liquid enclosed in a sealed transparent vessel by measuring intensity of the light passed through the liquid, comprising the steps of rotating said sealed vessel and then suddenly stopping the rotation of the vessel to cause the solid matter to swirl up in a rotary movement in the column of the still moving liquid; projecting light through said liquid in the vessel; capturing the light of reduced intensity



passed through the liquid by means of a line-scanning photometric element provided with multiple minute areas for receiving said transmitted light; and measuring the intensity of the captured light.

3,900,267

METHOD OF DETERMINING CATALYTIC ACTIVITY BY MEASURING THE RELATIVE REFLECTANCE OF THE CATALYST

Marvin F. L. Johnson, Homewood, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed May 17, 1974, Ser. No. 470,885
Int. Cl. G01n 21/48
U.S. Cl. 356—209 8 Claims

1. A method for determining the hydrocarbon hydrotreating activity of a first catalyst comprising a major amount of a solid porous support and a minor catalytically-effective amount of nickel at least a portion of which nickel being present in the Ni++ form and a minor, catalytically-effective amount of at least one additional metal selected from the group consisting of molybdenum, tungsten and mixtures thereof, at least a portion of said metal being present in an oxidized state, prior to said first catalyst being used in at least one reaction zone to catalyze hydrocarbon hydrotreating, which comprises:

1. determining the maximum relative reflectance of said first catalyst of light having a wave number in the range from about 16,000 $cm.^{-1}$ to about 17,000 $cm.^{-1}$;
2. determining the maximum relative reflectance of said first catalyst of light having a wave number of about 20,000 $cm.^{-1}$;
3. determining an activity ratio equal to the relative reflectance determined in step (1) minus the relative reflectance determined in step (2);
4. performing steps (1), (2) and (3) to determine the activity ratio of a standard catalyst having essentially the same elemental composition as said first catalyst and acceptable hydrocarbon hydrotreating activity;
5. comparing the activity ratios obtained in steps (3) and (4), provided that (a) an increase in activity ratio from step (3) to step (4) being indicative of reduced hydrocarbon hydrotreating activity of said first catalyst relative to said standard catalyst, (b) no change in activity ratio from step (3) to step (4) being indicative of essentially equal hydrocarbon hydrotreating activity of said first catalyst relative to said standard catalyst and (c) a decrease in activity ratio from step (3) to step (4) being indicative of

greater hydrocarbon hydrotreating activity of said first catalyst relative to said standard catalyst.

3,900,268

PEN WITH INK INJECTION SYSTEM

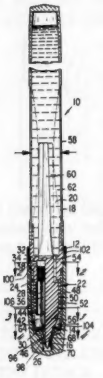
Edward Bok, Burgemeester Amersfoordtlaan 82, Badhoevedorp, Netherlands

Filed Sept. 11, 1973, Ser. No. 396,149

Claims priority, application Netherlands, Sept. 8, 1972, 7212745; Oct. 16, 1972, 7213945; Nov. 14, 1972, 7215137; Dec. 12, 1972, 7216870; Jan. 8, 1973, 7300219; Jan. 8, 1973, 7300220; Feb. 19, 1973, 7302247

Int. Cl.² B43K *5/10, 1/08, 1/10, 1/12*

U.S. Cl. 401—230 **13 Claims**



1. A pen, comprising:

a first ink reservoir,

a second ink reservoir beneath said first ink reservoir,

a pen tip in capillary communication with said second ink reservoir,

venting means extending upwardly from a position near the bottom of said second reservoir to the atmosphere,

at least one injection channel extending downwardly from said first reservoir to a position near the bottom of said second reservoir and of sufficient length to avoid capillary ink transport from said first reservoir to said second reservoir; and

means to manually inject ink from said first reservoir to said second reservoir.

3,900,269

CHANNEL JOINT AND JOINER THEREFOR

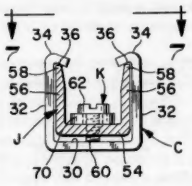
James Pavlot, Pittsburgh, Pa., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Nov. 7, 1974, Ser. No. 521,681

Int. Cl. F16d *1/00*

U.S. Cl. 403—292 **8 Claims**

1. A joint between a channel and a joiner, said channel having a generally U-shaped cross-sectional configuration and including a substantially flat bottom wall and opposite sidewalls having terminal end portions extending toward one another in overlying relationship to said bottom wall to define abutment surfaces facing toward said bottom wall, said joiner including a connecting tongue having a generally U-shaped cross-sectional configuration and including a substantially flat bottom wall and opposite sidewalls terminating in sidewall edges, said tongue being dimensioned for closely fitting within said channel with said tongue bottom wall closely adjacent said channel bottom wall, said tongue sidewalls having a height extending a major portion of the height of said channel sidewalls, and threaded biasing means including a head at one end for biasing said bottom walls away from one another to tightly urge said terminal edges of said tongue sidewalls against said abutment surfaces and hold said tongue and channel against longitudinal movement relative to one another; and the threaded biasing means having a length locating said head between the flat bottom wall of the tongue and a plane bisecting the height of said tongue sidewalls when said terminal edges are in engagement with said abutment surfaces.



3,900,270

SHAFT COUPLINGS

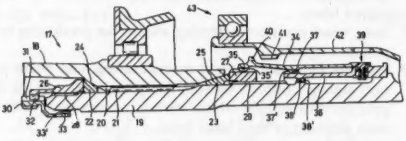
John Kenneth Rhodes, Sunnyhill, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Sept. 5, 1974, Ser. No. 503,509

Claims priority, application United Kingdom, Sept. 22, 1973, 44546/73

Int. Cl.² F16D *1/08*

U.S. Cl. 403—317 **1 Claim**



1. A shaft coupling comprising:

a first shaft portion and a second shaft portion, one of said shaft portions having axially extending external splines and the other of said shaft portions being hollow and having axially extending internal splines arranged to cooperate with the external splines of one of said portions;

means to restrain said shaft portions from moving axially relative to one another, said means including two annular members carried upon one of said shaft portions and having tapering surfaces, the other of said shaft portions having cooperating corresponding tapering surfaces;

means for translating said annular members on the one of said shaft portions, said translating means including screw nuts for respectively urging the tapering surfaces of said annular members into engagement with the tapering surfaces of the other of said shaft portions, screw threads on the one of said shaft portions for cooperating with said screw nuts;

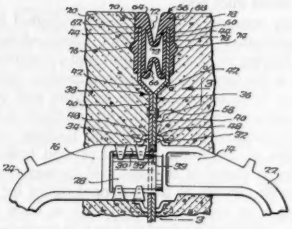
and means for locking said annular members on the one of said shaft portions for securing the screw nut against relative rotation with said shaft portions, said locking means comprising two axially movable members, each having a plurality of axially extending splines, said screw nuts having axially extending splines cooperating with said axially extending splines of said axially movable members, and one of said axially movable nut securing members having a spring-loaded plunger member to restrain it from both axial and rotational movement.

3,900,271

JOINT FORMING SEAL ASSEMBLY

Alfred F. Crone, Williamsville, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.

Filed Oct. 25, 1973, Ser. No. 409,426
Int. Cl.[2] E01C *11/02*
U.S. Cl. 404—68 14 Claims



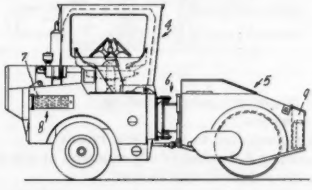
1. A joint forming seal assembly for use in a pavement contruction comprising: a pair of movable joint support members adapted to connect a pair of relatively movable adjacent pavement sections; a sealing member comprising an elongated elastic body having side portions engagable against opposed surfaces of said pavement sections; means connecting said sealing member to said joint supports for movement therewith to provide positive pressure sealing of each said side portion of said elastic body against said opposed surfaces of said pavement sections upon relative movement therebetween, said connecting means comprising a pair of center plates, each of said center plates being respectively mounted on one of said joint supports for relative movement therewith and connected to respective side portions of said sealing member, and locking means for locking each of said center plates in fixed position with respect to its respectively associated joint support.

3,900,272

COMPACTING MACHINE WITH MOVABLE BALLAST

Domenico Domenighetti, Via Nosetto 6, Bellinzona, Switzerland (6500)

Filed Oct. 9, 1973, Ser. No. 404,810
Claims priority, application Switzerland, Oct. 27, 1972, 15704/72
Int. Cl.[2] E01C *19/26*
U.S. Cl. 404—130 1 Claim



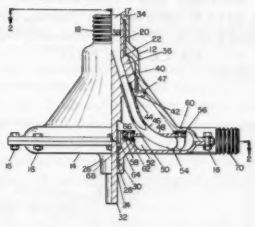
1. A compacting machine having cavities at the front and rear thereof and on opposite sides thereof, and prismatic ingots of a very heavy material each having a gripping handle, there being a plurality of said ingots in at least one of said cavities, said ingots having dimensions so related to the dimensions of said cavities that said plurality of ingots extend entirely across said at least one cavity in at least one direction, said compacting machine being of the combined type comprising a wheeled towing unit having a plurality of tired wheels rotatable on a bearing axle and a towed drum, said towed drum being a vibrating drum that rotates on a horizontal axis, said cavities being disposed in pairs, a forward pair being disposed in front of the bearing axle, and a rear pair of said cavities being disposed behind the axis of said vibrating drum.

3,900,273

CENTRIFUGAL AUTO-PRIMING PUMP

Larry L. Jackson, P.O. Box 595, Cripple Creek, Colo. 80813

Filed Apr. 30, 1974, Ser. No. 465,566
Int. Cl.[2] F04D *1/12*
U.S. Cl. 415—88 3 Claims



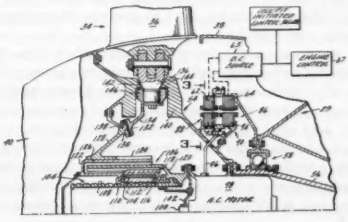
1. A pump comprising a casing having a central inlet for receiving a fluent material, a radially disposed outlet for discharging said fluent material and a central opening axially aligned with and opposing said inlet; a rotor comprising a shaft located centrally within said casing, said shaft having a first portion extending through said opening without said casing and a second enlarged hollow portion congruent with said inlet, said shaft further including a plurality of passages communicating from said hollow portion to within said casing; a sealing plate located within said casing, said plate dividing the space within said casing to define a pressure chamber, and an isolation space for support bearings of said rotor; and a plurality of tubular conduits connecting said passages to said pressure chamber and passing through said sealing plate, wherein rotation of said shaft causes fluid flow from said inlet to said outlet.

3,900,274

REMOTE CONTROLLED ACTUATION SYSTEM FOR THE ROTOR OF A GAS TURBINE ENGINE

Richard Paul Johnston, Peabody, and Dave Baer Levins, Swampscott, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed June 25, 1974, Ser. No. 482,857
Int. Cl. B64c *11/44*
U.S. Cl. 416—155 7 Claims



4. In a gas turbine engine of the variable pitch fan type having a static frame and rotatable fan frame, an actuation system for the variable pitch fan comprises:

an electric motor mounted for rotation with the rotatable fan frame,

stator winding means in fixed connection to the static frame,

rotor winding means in fixed connection to the fan frame for rotation therewith and in electrical connection to the

motor wherein rotation of the rotor operates to induce an electromotive force in the rotor windings to drive the motor when the stator windings receive an excitation current,

means interconnecting the motor to the fan in order that operation of the motor may be converted into variation of the pitch of the fan blades, and

means for varying the level and polarity of excitation current applied to the stator winding means.

3,900,275

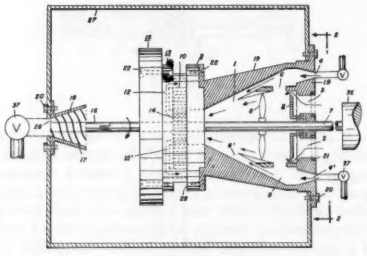
ROTARY AIR COMPRESSOR

Lewis Richter, 1414 E. 29th St., Des Moines, Iowa 50317

Filed Feb. 8, 1974, Ser. No. 440,743

Int. Cl. F04b *23/14*

U.S. Cl. 417—203 **6 Claims**



1. A Rotary Air Compressor built into the air space of a compressed air container, performs suction and air re-cycling, converts the pressurized air outflow through spiral turbine-rotor to assist its own driven shaft in the rotation comprising:

a. a pressureless hollow member defining a chamber with air passageway, connected by bolts to the inside of said container wall in which is located an impeller or airscrew rotatable by a driven shaft extending outside said container to an external driving power communicating with the atmosphere through at least one valved inlet port located in said hollow member defining a chamber wall, said shaft extending longitudinally from said container external surface through said hollow chamber passageway into said air outlet opening and into operative engagement to rotate simultaneously, said impeller, said air transfer channeled cover, said flywheel and said spiral turbine-rotor mounted on the same shaft;

b. at least one valveless air re-cycling inlet port also located in said hollow member defining a chamber wall, is connected to an annular duct to conwey re-cycling air towards said impeller;

c. a stationary wall, being fixed to said hollow member defining a chamber wall with a circularly arranged plurality of teeth having air cavities therebetween meshing with freely rotating seal gears has an axial opening in its center, said stationary wall surface is ground to cooperate with said rotatable cover ground surface forming therewith a sliding seal between said two surfaces against said container pressure as atmospheric or re-cycling air flows into said teeth cavities from said communication channels;

d. a rotatable cover, covering said teeth cavities as said cover trailing portion moves thereacross is connected to a flywheel on said shaft to assist in the rotation therewith, has ground surface which slides in rubbing contact upon said teeth tops, and mounted in and upon said stationary wall ground surface to communicate through said channels in said cover with the interior of said hollow member defining a chamber and teeth cavities to displace air into said container as said cover is rotated exposing said covered teeth cavities with atmospheric or recycling air encapsulated, to leave into said compressed air container;

e. a ring of gear teeth, having air cavities is mounted upon said stationary wall facing said container inner pressure receives air from said hollow member defining a chamber through channels to displace it into said container, and is at all times partly covered and sealed by the channeled cover;

f. an externally applied turnable shut-off air inlet plate, at said valved inlet port;

g. a freely rotating seal gear, being mounted before each communication channel outlet intermeshing with said teeth forcing air therefrom into said compressed air container in the direction of rotation leaving a vacuum in said cavities to receive additional air from said communication channel outlet, as said cover slidingly rotates;

h. communication channels in said rotating cover, which transfers air from the interior of said hollow member defining a chamber through said passageway by facing said teeth cavities at said channel outlet for registering with at least said one teeth cavity at each outlet as it rotates, is to said flywheel on one side sealingly connected forming therewith said closed channels;

i. said driven shaft having an extension within said container, on which extension is mounted a spiral turbine-rotor or impeller, that is set into a duct, through which duct said compressed air flows to said air outlet orifice to leave said container, said turbine being arranged to assist in turning said already powered driven shaft as air under pressure leaves said container, said orifice being controled by an independent shut-off valve to close and open said airflow from said container.

3,900,276

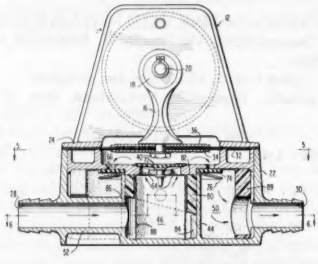
DIAPHRAGM PUMP METHOD AND APPARATUS

John Lewis Dilworth, Santa Monica, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed May 16, 1973, Ser. No. 360,819

Int. Cl. F04b *11/00*

U.S. Cl. 417—542 **7 Claims**



1. In a diaphragm pump including,

a frame means;

a motor connected to said frame means;

a connecting rod eccentrically mounted at one end thereof to a drive shaft of said motor;

fluid housing means mounted upon said frame means, including

a fluid entry port, and

a fluid exit port; and

flexible pump diaphragm means affixed to said connecting rod at the other end thereof and intercalated between said frame means and said fluid housing means;

the improvement comprising:

a first cylindrical tubular wall means coaxially positioned within said housing means for defining,

an inlet chamber within said tubular wall means, and an outlet chamber exterior of said tubular wall and interior of said fluid housing means, said outlet chamber

circumferentially extending about said tubular wall means;

a cylindrical sleeve of volumetrically compressible material positioned within said inlet chamber about and disposed in full contact with said first tubular wall means for attenuating fluid pulsations within said inlet chamber;

a second cylindrical wall concentrically extending radially outwardly of said tubular wall means to define a concentrically annular fluid outlet chamber;

a cylindrical sleeve of volumetrically compressible material positioned within said outlet chamber contiguously extending about said second cylindrical wall for attenuating fluid pulsations within said outlet chamber;

conduit means extending between and placing in fluid communication said inlet port and said inlet chamber;

valve plate means mounted between said diaphragm and one end of said coaxial tubular wall means and defining a pumping chamber coaxially extending above said inlet chamber and said outlet chamber, said valve plate having a plurality of inlet ports communicating between said inlet chamber and said pumping chamber, and a plurality of outlet ports communicating between said pumping chamber and said outlet chamber;

first valve means operably covering said inlet ports for permitting fluid to flow from said inlet chamber into said pumping chamber but preventing fluid from flowing from said pumping chamber into said inlet chamber;

second valve means operably covering said outlet ports for permitting fluid to flow from said pumping chamber into said outlet chamber but preventing fluid from flowing from said outlet chamber into said pumping chamber, whereby upon actuation of said motor said eccentric mounted connecting rod will serve to reciprocate said diaphragm coaxially with said inlet chamber to draw fluid through said conduit means into said inlet chamber, past said first valve means into said pumping chamber, and force fluid from said pumping chamber past said second valve means into said circumferential outlet chamber and out said exit port.

3,900,277

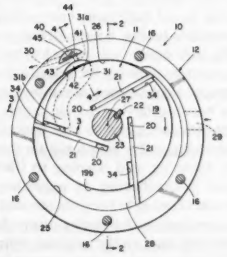
ROTARY COMPRESSOR

Alwin B. Newton, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 261,846, June 12, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,512

Int. Cl. F01c *21/12*

U.S. Cl. 418—184 **1 Claim**



1. A rotary gas compressor comprising a housing having a substantially cylindrical interior surface and opposed end plates defining a closed chamber;

a rotor having a cylindrical peripheral surface and opposed side faces, said rotor being mounted in said chamber and rotatable about an axis which is offset with respect to the axis of said cylindrical interior surface, said rotor and said housing defining a generally crescent shaped compression cavity;

a gas inlet port and a gas discharge port communicating with said compression cavity;

a valve associated with said gas discharge port;

a plurality of vanes slidably supported in said rotor and engaging said cylindrical interior surface;

means defining an elongated slot in at least one of said end plates having an exit end located in communication with said discharge port and an entrance end located at a point circumferentially spaced in a direction toward said inlet port and inwardly spaced from said cylindrical peripheral surface, the entire slot being substantially covered by one of the side faces of said rotor; and

means defining a passage immediately adjacent each vane in said one rotor end surface extending away from the cylindrical surface and providing a first flow path for gas which intermittently connects that portion of the compression cavity ahead of the vane with the entrance end of said elongated slot, a second flow path, communicating with said discharge port, for gas being provided between the cylindrical surface on said rotor, the cylindrical interior surface of said housing and said end plates within said housing.

3,900,278

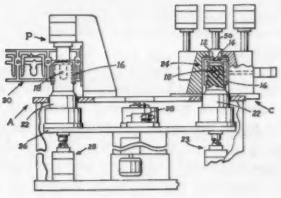
APPARATUS FOR MOLDING LAMP SOCKETS ONTO PAIRED INSULATED CONDUCTORS

Henry T. Beck, Toronto, and Rudolph Koehler, Willowdale, both of Canada, assignors to Noma Lites Canada Limited, Scarborough, Canada

Division of Ser. No. 857,452, Sept. 12, 1969. This application Oct. 9, 1973, Ser. No. 404,778

Int. Cl. B29c *6/04*

U.S. Cl. 425—123 **5 Claims**



1. Apparatus for molding lamp sockets onto paired insulated conductors comprising:

a core movable between a loading station and a molding station, said core member having slots for receiving and maintaining a pair of pointed electrical contacts in spaced relation with their points exposed for penetration into respective conductors to establish electrical connection therewith and with their margins extending from said core member for embedment in molding material;

means at said loading station for locating said contacts in said slots as aforesaid;

mold sections at said molding station movable between a closed position in which they surround said core member, cooperating with it to form a mold cavity of annular configuration for receiving molding material, and an open position in which said mold sections are separated from each other and from said core member enabling release of the molded socket and removal of the core member;

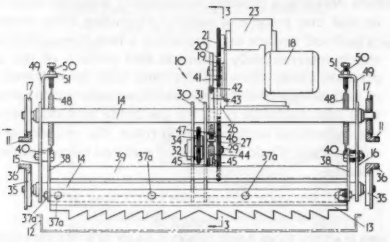
a plunger disengageably engageable with said mold sections in their closed position aforesaid to seal the resultant mold cavity with said paired conductors captured therein and with said plunger applying pressure to said paired conductors to assist, at least, and to maintain penetration of said contact points into respective conductors to establish electrical connection therewith, and

means for injecting molding material into said cavity while the plunger maintains pressure on said conductors as aforesaid.

3,900,279
APPARATUS FOR FORMING A PATTERN ON THE SURFACE OF A MOLDABLE MATERIAL

Ronald Newby, Borehamwood, England, assignor to John Laing and Son Limited, London, England

Continuation-in-part of Ser. No. 155,810, June 23, 1971, abandoned. This application Nov. 6, 1973, Ser. No. 413,220
Claims priority, application United Kingdom, June 30, 1970, 31486/70
Int. Cl. B28b *11/08*
U.S. Cl. 425—385 **11 Claims**



1. Apparatus for forming a pattern on the surface of a moldable material comprising

a frame adapted to extend across a mold;

spaced pivotally mounted arms on said frame;

a pattern-forming means mounted on and between said arms to extend across the mold;

drive means for pivoting said arms relative to said frame to move said pattern-forming means arcuately relative to the frame; and

means for effecting relative movement between said frame and the mold, said latter means including a prime mover with said drive means being connected to said prime mover to be driven in synchronism with said means for effecting relative movement, whereby during use said movements of said frame and said arms cause a predetermined repetitive pattern to be formed on the surface of the material in the mold.

3,900,280
APPARATUS FOR STRETCHING A TUBULAR WORK PIECE

Eugene T. Herman, St. Marys, and Kenneth W. McIntosh, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 28, 1974, Ser. No. 437,111
Int. Cl.² B29C *17/02*
U.S. Cl. 425—392 **11 Claims**

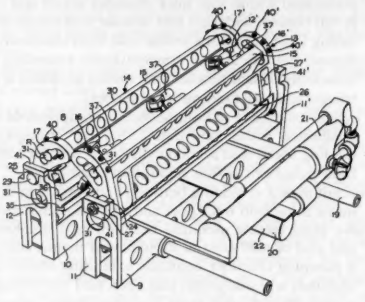
1. An apparatus for stretching a flexible resilient tubular work piece in at least two nonparallel directions perpendicular to the longitudinal axis of said work piece, said apparatus comprising:

A. a first frame member;

B. a second frame member spaced from said first frame member;

C. means mounting said frame members for relative movement of at least one said frame member toward and away from the other said frame member; and

D. a pair of spaced pivotably movable gripping means carried on at least one said frame member and gripping means carried on the other said frame member with each said gripping means having a gripping portion for gripping the work piece at spaced gripping locations on the periphery of the external surface thereof, the pair of pivotably movable gripping means being pivotable about a pair of spaced axes of rotation so that when said frame members move in one axial direction away from each other the pivotably movable means is free to pivot and the work

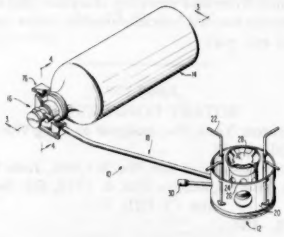


piece is stretched in two nonparallel directions perpendicular to the longitudinal axis of said work piece.

3,900,281
BACKPACKER'S STOVE

Harvey Larry Penberthy, 5624 S.W. Admiral Way, Seattle, Wash. 98116

Continuation-in-part of Ser. No. 352,948, April 20, 1973, Pat. No. 3,829,278. This application Apr. 26, 1974, Ser. No. 464,298
Int. Cl. F24c *5/20*
U.S. Cl. 431—344 **8 Claims**



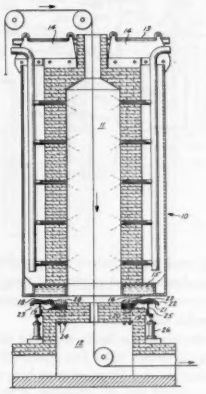
1. A portable liquid fuel stove comprising a burner assembly, a fuel container having a neck defining a container opening, means for delivering fuel under pressure from said container to said burner assembly including a fuel tube in communication between said burner assembly and said fuel container, and a housing having an air pump and a fuel outlet passage in communication with said fuel tube, said air pump including a cylinder and a piston within said cylinder, means for releasably securing said housing to the neck of said fuel container, said piston having an actuating handle operable externally of said housing to reciprocate said piston to pressurize the fuel container and thereby pump fuel from said fuel container into said fuel outlet passage when said housing is secured to said container, a valve carried by said housing for controlling the flow of fuel through said outlet passage and said fuel tube to said burner assembly, and means for releasably connecting said fuel tube and said housing whereby said housing and said fuel container are separable from said burner assembly, said releasable connecting means including a clamp having a clamping element carried by one of said fuel tube and said housing and a keeper carried by the other of said fuel tube and said housing and cooperable between said housing and said fuel tube to releasably clamp said fuel tube and said housing one to the other.

3,900,282

FURNACE SEAL

Thomas A. Seeburger, Hillsborough, Calif., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed May 15, 1974, Ser. No. 470,247
Int. Cl.[2] F27B 9/028; F27D 3/00
U.S. Cl. 432—59 4 Claims



1. In a heating furnace having a support base portion and an upper portion in alignment therewith and separable therefrom, an improved seal comprising:

a. a cooling jacket fixedly mounted on the lower end of the upper portion,

a flexible high temperature cloth-like refractory blanket having one end fixedly mounted on the upper surface of the support base and extending freely therefrom toward the outer periphery of the furnace, and

c. means for biasing the other end of the high temperature refractory blanket into contact with the cooling jacket to form a seal between the cooling jacket and the support base.

3,900,283

PROCESS FOR THE DYEING OF MATERIALS CONSISTING OF ANION-MODIFIED POLYACRYLONITRILE, POLYAMIDE AND POLYESTER FIBRES

Dietrich Hildebrand, Odenthal; Winfried Kruckenberg; Werner Kuhnel, both of Leverkusen; Hans Heinz Molls, Cologne-Flittard, and Karlheinz Wolf, Cologne-Stammheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Sept. 9, 1969, Ser. No. 856,468
Claims priority, application Germany, Mar. 1, 1969, 1910587
Int. Cl. D06p 5/00
U.S. Cl. 8—21 A 7 Claims

1. In a process for dyeing anionically modified synthetic material selected from the class consisting of polyacrylonitrile containing internal anionic groups, polyamide containing internal anionic groups, polyesters containing internal anionic groups, and mixtures of said materials with other fiber materials, wherein the internal anionic groups are strong anionic groups that are attached to the internal portion of the molecular chains and are frequently repeated along the molecular chains, the improvement which comprises padding or printing said materials with aqueous dispersions containing the salt of a basic dyestuff which is free from carboxylic acid and sulfonic acid groups and a polynuclear aromatic sulfonic acid selected from the class consisting of diphenyl sulfonic acid, naphthalene di-, tri-, or tetrasulphonic acid, and pyrene tetrasulfonic acid, and subsequently subjecting the thus treated materials to a heat treatment.

3,900,284

PROCESS FOR THE REMOVAL OF SILVER NITRATE STAINS

John D. Ciko, Allen Park, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed June 21, 1973, Ser. No. 372,014
Int. Cl.[2] D06L 3/06, 3/08
U.S. Cl. 8—109 6 Claims

1. The method of removing silver nitrate stains from fabrics comprising:

a. soaking the fabric in an aqueous bath,

b. bleaching the fabric with a chlorine bleach,

c. rinsing the fabric with water substantially removing the bleach,

d. adding sufficient thiosulfate salt wherein the concentration of said thiosulfate exceeds that of the silver by a factor of from about 22 to about 130,

e. adjusting the pH to a range of about 5.0 to about 13.0,

f. maintaining the temperature of the bath from about 50° to about 150° F., and

g. effectively rinsing the fabric with water substantially removing the thiosulfate salt.

3,900,285

PROCESS FOR PRODUCING FIREPROOF FIBERS

Michakaze Ono; Hajime Sahara, and Masonori Akasaka, all of Nagoya, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1972, Ser. No. 299,401
Claims priority, application Japan, Oct. 21, 1971, 46-83511
Int. Cl. D06c 1/00
U.S. Cl. 8—115.5 13 Claims

1. A process for producing fireproof fibers which comprises contacting an acrylic fiber with hydroxylamine to effect chemical reaction at a pH of not higher than 7 at a temperature of below 200°C for a time sufficient that the contacted fiber has a solubility of not more than 50% in dimethylformamide at 90°C and heating the contacted fiber to oxidize the fiber at a temperature of 245°C to 305°C in a gaseous atmosphere.

3,900,286

DYESTUFF PREPARATIONS AND PROCESSES FOR THE DYEING OF SYNTHETIC ORGANIC MATERIAL

Jacques Wegmann, Bettingen, and Richard Peter, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Nov. 13, 1972, Ser. No. 305,769
Claims priority, application Switzerland, Nov. 19, 1971, 016869/71; Nov. 19, 1971, 016870/71
Int. Cl. D06p 5/06
U.S. Cl. 8—172 15 Claims

1. A dyestuff preparation consisting essentially of 5 to 80% of a finely dispersed dispersion dyestuff having a maximum particle size of 10 μ; 5 to 200%, relative to the amount of dyestuff, of a low-polymeric compound which is soluble in halogenated hydrocarbons, and which is a polyurea, a polyamide or a polyvinylpyrrolidone compound; and 20 to 95%, relative to the dyestuff preparation, of an inert, organic compound soluble in halogenated hydrocarbons and having a boiling point of above 200°C, said organic compound containing, in addition to carbon and hydrogen, at most, halogen atoms, or oxygen bound solely to carbon atoms, and having a molecular weight of 100 to 10,000.

3,900,287

EXHAUST DISPERSE DYEING OF SYNTHETIC POLYMERS UTILIZING A SATURATED LIQUID FLUOROCARBON

Harold Leonard Jackson, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 9, 1973, Ser. No. 322,127
Int. Cl. D06p *1/90*
U.S. Cl. 8—174 11 Claims

1. Exhaust dyeing process providing a high degree of exhaust and fixation and wherein disperse dyes are applied to and fixed in disperse dyeable synthetic polymers in the form of films, fibers or fabrics, said process comprising:

a. admixing an organic disperse dye, a suitable organic solvent and a saturated liquid fluorocarbon having a fluorine to carbon atom ratio of at least one, a solubility parameter of less than 7.0 and a critical temperature of at least 135°C., said organic solvent having a boiling point less than the boiling point of the liquid fluorocarbon;

b. contacting the disperse dyeable synthetic polymer with the mixture from (a); and

c. heating to evaporate the organic solvent, and then continuing heating at a temperature greater than the glass transition temperature of the synthetic polymer to fix the dye in the polymer.

3,900,288

METHOXYMETHANE STERILIZATION METHOD

Irving E. Levine, Mill Valley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 387,869, Aug. 13, 1973, abandoned, which is a division of Ser. No. 337,519, March 2, 1973, Pat. No. 3,795,750, which is a continuation-in-part of Ser. Nos. 65,695, Aug. 20, 1970, abandoned, and Ser. No. 238,601, March 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 163,532, July 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 65,695, Aug. 20, 1970. This application Sept. 30, 1974, Ser. No. 510,201
Int. Cl. A61l *13/00*
U.S. Cl. 21—58 5 Claims

1. Sterilization method comprising contacting a surface, a product or an article contaminated by microorganisms with an effective amount of methoxymethane under pressure and for a contact time adequate to kill the microorganisms, releasing the pressure and removing the methoxymethane by evaporation.

3,900,289

APPARATUS AND METHOD FOR FILLING A COMPARTMENT

Max D. Liston, Irvine, Calif., assignor to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 133,081, April 12, 1971, Pat. No. 3,748,044. This application May 3, 1973, Ser. No. 357,066
Int. Cl.[2] G01N *1/14, 33/16*
U.S. Cl. 23—230 R 6 Claims

3. A method for filling a compartment to a predetermined level with an aqueous solution taken from a reservoir of aqueous solution having a surface by means of a hollow probe nozzle having an inside diameter of between about 0.010 to 0.020 inches and an end point, said method comprising the steps of:

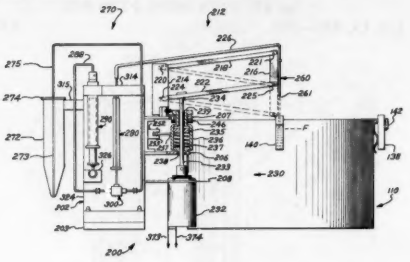
positioning the end point not more than two millimeters under the surface of the solution;

drawing a predetermined amount of solution through the end point of the hollow probe nozzle;

retaining the end point under the surface of the solution for a first predetermined period of time after the predetermined amount of solution has been drawn through the end point of the hollow probe nozzle;

rapidly accelerating the hollow probe nozzle from the solution;

positioning the end point in the compartment at a predetermined level such that the end point is not more than two millimeters below the surface of the solution after the solution is ejected from the hollow probe nozzle into the compartment;



retaining the end point below the predetermined level for a second predetermined period of time after the predetermined amount of solution has been ejected from the hollow probe nozzle; and

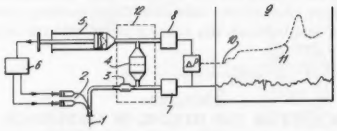
rapidly accelerating the hollow probe nozzle from the compartment.

3,900,290

METHOD AND APPARATUS FOR DETERMINING THE DEGREE OF PLATELET AGGREGATION IN BLOOD

Gerard Hornstra, Klaaswaal, Netherlands, assignor to N.V. Internationale Octrooi Maatschappij "Octropa", Rotterdam, Netherlands

Filed Mar. 12, 1974, Ser. No. 450,529
Claims priority, application Netherlands, Mar. 13, 1973, 7303522
Int. Cl.[2] G01N *15/00, 33/16*
U.S. Cl. 23—230 B 7 Claims



1. An apparatus for determining the degree of platelet aggregation in blood comprising, connected in series by tubing, sample supply means for supply of a sample of blood to be examined,

a filter having a pore size which allows red and white blood cells to pass but prevents passage of aggregated platelets,

a pump for drawing blood from said supply and through the filter,

and pressure measuring means for measuring the pressure drop across the filter.

3,900,291

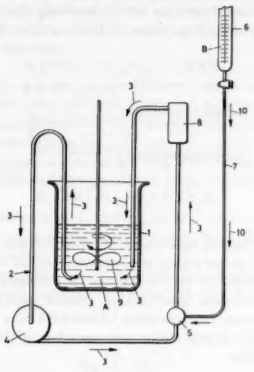
APPARATUS FOR DETERMINING THE POINT OF COLOUR CHANGE IN VOLUMETRIC CHEMICAL ANALYSES

Mario Tullo Francardi, Bergamo, Italy, assignor to Italcementi S.p.A. Fabbriche Riunite Cemento, Bergamo, Italy

Filed Nov. 5, 1973, Ser. No. 412,622
Claims priority, application Italy, Dec. 29, 1972, 33793/72
Int. Cl. G01n *31/16*
U.S. Cl. 23—253 R 8 Claims

1. An apparatus for detecting the point of colour change in a volumetric chemical analysis, comprising a container for containing the solution to be titrated, a titrant solution feeder,

flow defining means forming a closed forced circulation circuit having an inlet and a return in said container, a mixer connected to said titrant solution feeder and included in said closed circuit for introducing a titrant solution to a solution being circulated within said closed circuit, said closed circuit



including a colour detection cell with transparent walls downstream of said mixer and upstream of said return in the direction of circulation of a solution to be titrated, said colour detection cell being separated from said container and of a reduced size with respect to said container.

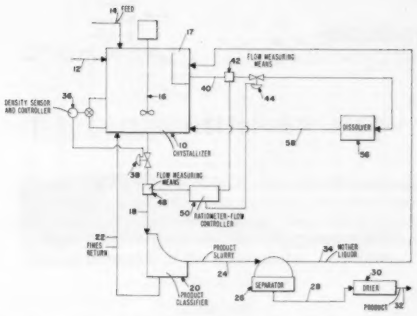
3,900,292

AUTOMATIC CONTROL OF CRYSTAL SIZE DISTRIBUTION

James Logan Fairchild, Trona, Calif., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Continuation of Ser. No. 96,179, Dec. 8, 1970, abandoned.
This application Dec. 11, 1972, Ser. No. 313,852
Int. Cl. B01d *9/00*
U.S. Cl. 23—273 R **4 Claims**

1. In a process for continuously producing crystals which comprises establishing in a crystallizing zone a slurry of (1) a mother liquor, (2) crystallizable material and (3) crystals of said crystallizable materials, monitoring the slurry density in the crystallizing zone using a slurry density sensing means and controlling the slurry density by increasing or decreasing the rate at which a first slurry is withdrawn from a well-mixed portion of said crystallizing zone and classified by size into two slurries, one of which contains small crystals which is returned to the crystallizing zone and the other of which contains predominantly large crystals, recovering as product said large crystals from said other slurry and returning the remaining mother liquor therefrom to the crystallizing zone, measuring



the rate at which said first slurry is withdrawn from the crystallization zone while withdrawing a seed slurry containing predominantly seed crystals from a baffled, quiescent zone within the crystallizing zone which quiescent zone separates said crystals by a settling method, treating said seed slurry to render it seed-free and returning the seed-free slurry to said crystallization zone: the improvement which comprises producing said product crystals within a prescribed, desired size distribution by maintaining a fixed predetermined ratio of withdrawal rates between said first slurry and said seed slurry.

CHEMICAL

3,900,293
CONTROLLING ADMIXTURE OF AQUEOUS LIQUID TO BALL ROLLING OF POWDERY IRON ORE

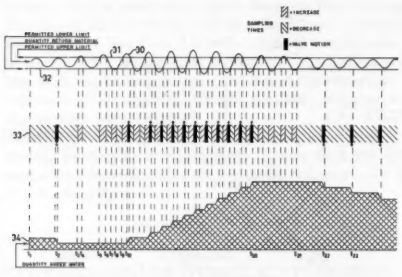
Borje Gustav Sjoberg; Rolf Ragnar Odman; Arne Belstad, and Nils Clov Allan Lofgren, all of Malmberget, Sweden, assignors to Luossavaara-Kiirumavaara AB., Stockholm, Sweden

Filed Dec. 29, 1972, Ser. No. 319,467

Claims priority, application Sweden, Dec. 30, 1971, 16944/71

Int. Cl. C21b *1/08, 1/24;* **B01j** *2/12*

U.S. Cl. 23—313 **2 Claims**



1. A method of controlling a supply of liquid to a material composition adapted to be formed into balls for sintering, said composition being constituted of a slick consisting of a mixture of powdery iron ore material and aqueous liquid in a ball rolling machine comprising an open ended rotary ball rolling drum to an entrance end of which is supplied a supply of fresh slick and a supply of said ore material which has already passed through the rotary drum and which after having left the drum at an exit end remote from said entrance end, has passed through a sieve separating material which upon passing the drum is below a size of balls of a prescribed size to be passed on as a final product of the machine, said separated smaller-sized material passing through the sieve being reconveyed from said exit end back to said entrance end of the drum at a rate corresponding substantially to the rate of which said reconveyed material passes through the sieve, the liquid content of the material being treated in the drum being adjusted by varying a supply of aqueous liquid being added to the material so as to change the consistency of the material, measuring amplitudes of variations in the rate at which said material is reconveyed from said exit end to said entrance end of the drum, ascertaining whether said amplitudes increase above or decrease below a predetermined variation amplitude, increasing said rate of supply of said consistency adjusting aqueous liquid when said amplitudes increase above said predetermined amplitude and decreasing said rate of supply of said consistency adjusting aqueous liquid when said amplitudes decrease below said predetermined amplitude.

3,900,294
METHOD OF MANUFACTURING SPHERICAL BEARINGS

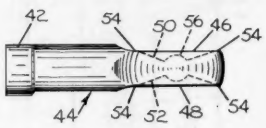
Albert R. McCloskey, Fairfield, Conn., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Aug. 23, 1974, Ser. No. 499,940

Int. Cl.² B23P *11/00;* **B21D** *53/10*

U.S. Cl. 29—149.5 B **8 Claims**

1. A method of manufacturing a spherical bearing rod end having an outer member, an intermediate member of yieldable material within and supported by said outer member and an inner race operationally supported by said intermediate member comprising preforming a rod end blank having a ball-like section at one end thereof, flattening the ball-like section to form two enlarged faces, each face having an inwardly disposed annular dished portion whereby the material flows uniformly to the outer periphery of the faces to form a uniformly cold formed annular area, removing the inwardly disposed annular dished portion to form a bore through said



faces thereby leaving said uniformly cold formed annular area to serve as the outer race member, inserting in said bore said intermediate member and said inner race member, interlocking with mechanical interlocking means said intermediate member and inner race member within said bore to effect the bearing support of said inner race member within said intermediate member.

3,900,295
BILAYER METALLIC ARTICLE

James Q. Steigelman, Towanda, Pa., assignor to W. M. Chace Company, Detroit, Mich.

Continuation of Ser. No. 138,779, April 29, 1971, abandoned. This application May 29, 1973, Ser. No. 364,976

Int. Cl. B32b *15/00*

U.S. Cl. 29—196.3 **2 Claims**

1. A laminate consisting essentially of a layer of a martensitic stainless steel alloy selected from the group consisting of the 400 series stainless steel alloys and precipitation hardened stainless steel alloys and metallurgically bonded along a common interface to a layer of a primary brazing alloy in the unbrazed state, said primary brazing alloy having a melting point above 900°F and below about 1800°F, said metallurgical bond being achieved by diffusing a secondary brazing alloy having a melting point of at least 30°F lower than said primary brazing but above about 900°F into said layer of martensitic stainless steel alloy and said layer of primary brazing alloy, said laminate being in the form of a composite strip having a thickness of less than 0.185 inches.

3,900,296
COMPOSITE MAGNESIUM-TITANIUM CONDUCTOR

Henry A. Kuchek, Auburn, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 402,563, Oct. 1, 1973, Pat. No. 3,849,879. This application Aug. 1, 1974, Ser. No. 493,810

Int. Cl. B32b *15/00;* **H01b** *13/22*

U.S. Cl. 29—197 **11 Claims**

1. A composite comprising an in situ cast core consisting essentially of about 0.05 to about 10 weight per cent lithium and the balance magnesium with a titanium cladding.

3,900,297
FUEL FOR ENGINES

James Michaels, 26 Valmont Ln., Commack, N.Y. 11725

Continuation-in-part of Ser. No. 150,822, June 7, 1971, abandoned. This application Sept. 29, 1972, Ser. No. 293,576

Int. Cl. C10l *1/22*

U.S. Cl. 44—57 **16 Claims**

1. Fuel composition for internal combustion engines comprising a homogeneous blend of

A. 5 to 95 volume percent of gasoline, and correspondingly

B. 95 to 5 volume percent of a blend comprising

a. 10 to 90 volume percent of a nitroalkane having one or two nitro groups, and containing up to four carbon atoms, and mixtures thereof, and correspondingly

b. 90 to 10 volume percent of a normally liquid ester lubricant having a viscosity at 100°F. of at least 1 cSt. selected from the group consisting of esters of

i. primary alcohols, linear or branched chain, and dicarboxylic acids, linear or branched chain, having the formula

$$R_1OOC - C_nH_{2n} - COOR_2$$

wherein n is an integer of from 2 to 10 and R_1 and R_2, which may be the same or different, are alkyl, straight chain or branched, having from 4 to 12 carbon atoms,

ii. monocarboxylic acids and dihydric alcohols and/or polyalkylene glycols having the formula

$$R_1COO\,(C_mH_{2m}O)_rOCR_2$$

wherein m is an integer of from 2 to 12, r is an integer of from 1 to 10, and R_1 and R_2 have the afore-stated meanings,

iii. neopentyl polyols and monocarboxylic acids, straight chain or branched, having the formula

wherein R_3 to R_6, which may be the same or different, are selected from the group consisting of (1) alkyl, straight chain or branched, having from 1 to 10 carbon atoms, and (2) radicals of the formula $C_sH_{2s}OOCR_7$ wherein s is an integer of from 1 to 4, and R_7 is alkyl, straight chain or branched, having from 4 to 12 carbon atoms, with the proviso that not more than two of the R_3 to R_6 groups may be alkyl, and

iv. mixed complex esters of primary alcohols, straight chain or branched, mono- and dicarboxylic acids, straight chain or branched, and polyalkylene glycols, having the formulas

$$R_1 - OOC - C_nH_{2n} - COO\left[(C_mH_{2m}O)_r - OC - C_nH_{2n} - COO\right]_x - R_2$$

and

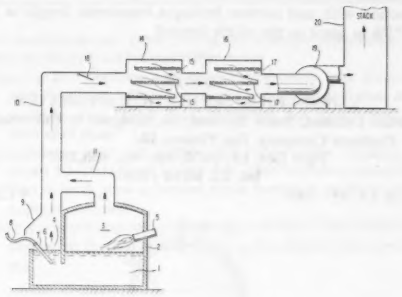
$$R_1COO - (C_mH_{2m}O)_r\left[OC_nH_{2n} - COO - (C_mH_{2m}O)\right]_y - OCR_2$$

wherein R_1, R_2, m, n, and r have the afore-stated meanings and x and y are integers of from 1 to 4,

and mixtures thereof,

with the proviso that the proportion of ester lubricant in the fuel treating the gaseous effluent to remove entrained solids having a particle size greater than 1 micron; and

passing the treated effluent into intimate contact with and through a bed of granular activated alumina, the granular alumina having a size of from 300 to 5,000 microns and



the bed having a depth of from about 5 to 50 centimeters, at a temperature between about 110°C. and about 500°C. to remove a quantity of the metal halide solids having a particle size of less than 0.1 microns at least sufficient to prevent formation of the white smoke.

3,900,298

PREVENTION OF AIR POLLUTION BY USING ACTIVATED ALUMINA SOLID ADSORBENT TO REMOVE PARTICULATES OF LESS THAN 0.5 MICRONS FROM FLUE GASES

Lewis A. St. Cyr, Sandusky, and Loren H. Young, Huron, both of Ohio, assignors to Vulcan Materials Company, Birmingham, Ala.

Continuation-in-part of Ser. No. 228,087, Feb. 22, 1972, Pat. No. 3,762,134, which is a continuation-in-part of Ser. No. 130,398, April 1, 1971, Pat. No. 3,750,372. This application July 13, 1973, Ser. No. 378,908

Int. Cl. B01d *53/04*

U.S. Cl. 55—71 **2 Claims**

1. An air pollution control process for the prevention of white smoke in the atmosphere and caused by finely divided metal halide solids having a particle size of less than 0.1 microns from a gaseous effluent of an aluminum processing operation utilizing a gaseous chlorine treatment of molten aluminum, which process comprises

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3,900,299

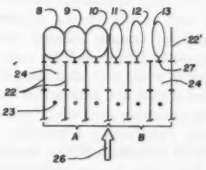
EXPANDING VALVES FOR ELECTROSTATIC PRECIPITATORS AND THE LIKE

Charles W. Spehrley, White River Junction, Vt., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed June 6, 1973, Ser. No. 367,460

Int. Cl. B03c *3/36*

U.S. Cl. 55—133 **9 Claims**



1. A flow control system for an electrostatic precipitator having an assembly of parallel vertically extending laterally spaced collecting curtains carried within a housing comprising; a plurality of elongated flexible substantially cylindrical vertically extending inflatable containers secured within said housing in juxtaposition with each other and respective ones of said curtains to shut off gas flow between certain of said curtains when the ones of said containers respective to said certain curtains are inflated and to allow substantially free gas flow between said curtains when said containers are deflated, means for alternatively inflating certain of said containers and means for simultaneously deflating other of said containers, and said containers extending between and being connected to top and bottom mandrel elements, at least a portion of each of said mandrel elements adjacent the connection between a respective mandrel element and container being of non-circular cross section, said portion having a maximum transverse length at least one and three quarters as great as the maximum transverse width thereof.

7. A flow control system for a gas handling apparatus having at least one gas conducting passageway therein comprising: at least one elongated flexible substantially cylindrical inflatable container located at adjacent one end portion of said passage-

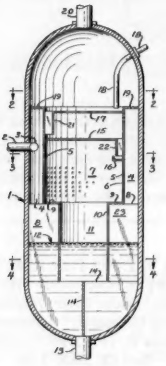
way, means for inflating said container to stop gas flow through said passageway, means for deflating said container to allow substantially free flow through said passageway, said container extending between and connected to top and bottom mandrel elements, at least a portion of each of said mandrel elements adjacent the connection between a respective mandrel element and container being of non-circular cross section with said portion having a transverse length at least 175% as great as the width thereof.

3,900,300

VAPOR-LIQUID SEPARATION APPARATUS

Bruce Lehman, South Holland, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Oct. 19, 1974, Ser. No. 408,139
Int. Cl. B01d *19/00*
U.S. Cl. 55—184 **4 Claims**



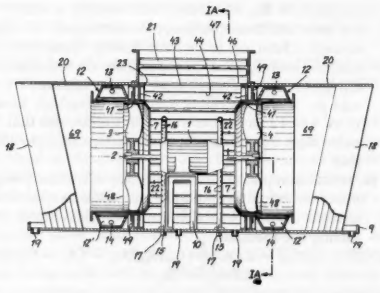
1. A vapor-liquid separation apparatus which comprises:
a. a vertically orientated cylindrical outer vessel;
b. a cylindrical wall axially aligned within the vessel and forming an annular volume located between the inner surface of the outer vessel and the outer surface of the upper cylindrical wall, and also forming a cylindrical volume located within the cylindrical wall, said annular volume having an upper seal which prevents fluid flow, said cylindrical wall having a plurality of perforations located a vertical distance below a hereinafter described mixed-phase fluid inlet means, which perforations allow the passage of fluids from the annular volume into the cylindrical volume;
c. a mixed-phase fluid inlet means passing into the vessel and discharging an entering fluid mixture into the annular volume in a substantially tangential direction relative to the inner surface of the outer vessel;
d. a liquid outlet means passing through a wall of the vessel and communicating with a bottom portion of the internal volume of the vessel to effect the withdrawal of separated liquid material which entered the annular volume via the mixed-phase fluid inlet means and descended through said annular volume into the lower portion of the vessel;
e. a liquid-vapor contacting means located in said cylindrical volume at a point above said perforations in the cylindrical wall, said liquid-vapor contacting means extending across the cylindrical volume to effect the passage of vapor entering the cylindrical volume from the annular volume through the vapor-liquid contacting means;
f. a liquid inlet means passing through a wall of the vessel and extending to an upper portion of said liquid-vapor contacting means;
g. a vapor outlet means passing through a wall of the vessel and communicating with an upper portion of the internal volume of the vessel which is above said liquid-vapor contacting means to effect the withdrawal of a vapor from the vessel, said vapor having passed into the vessel and into the annular volume via said mixed-phase fluid inlet means and then into the cylindrical volume through the perforations in said cylindrical wall before having passed upward through the liquid-vapor contacting means, whereby a mixed-phase stream is divided into a liquid fraction which descends through the annular volume and a vapor fraction which separates from the liquid and passes through perforations in the cylindrical wall before traveling upward through the liquid-vapor contacting means wherein liquid material entrained in the vapor is removed by contacting the vapor with an externally produced liquid material.

3,900,301

AIR TREATMENT APPARATUS

Petre Constantinescu, Bucharest; Emil Oachis; Dorin Trimbitas, both of Cluj, and Doina Alexandrescu, Bucharest, all of Romania, assignors to Intreprinderea Metalul Rosu Cluj, Cluj, Romania

Filed July 16, 1974, Ser. No. 488,927
Int. Cl. B01f *3/04*
U.S. Cl. 55—257 **10 Claims**

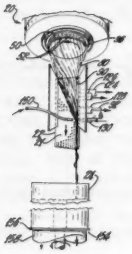


1. An air treatment apparatus comprising:
a rectangular prismatic housing defining a blending chamber;
rectangular extensions of two opposite sides of said blending chamber defining ducts for carrying an air flow from said blending chamber;
air inlets formed in the top wall and two opposite facing side walls of said blending chamber at right angles to said ducts;
air outlets formed in the two remaining side walls of said blending chamber feeding into said ducts;
a pair of oppositely effective axial flow fans mounted on a common drive shaft in said blending chamber and respectively juxtaposed with said outlets;
means for rotating said fans in the same direction;
respective means adjacent each of said fans for humidifying air drawn into said blending chamber by said fans;
respective means adjacent each of said fans for cooling air drawn into said blending chamber by said fans;
respective air heating means downstream of each of said outlets in said ducts for heating the air traversing same;
respective turbulence abatement chambers downstream of each of said outlets;
respective demisters spanning said ducts downstream of each of said outlets; and
means connecting at least one of said inlets with a source of fresh air.

3,900,302
METHOD FOR PRODUCING GLASS FIBER BULK PRODUCT

Roland E. Langlois, and Cletis L. Roberson, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 279,575, Aug. 10, 1972, Pat. No. 3,832,840. This application May 7, 1974, Ser. No. 467,705
Int. Cl. C03b *37/04*
U.S. Cl. 65—8 9 Claims



1. The method of producing a bulky sliver-like fibrous glass product comprising:

depositing individual discontinuous glass fibers on a perforated surface in sufficient number and degree of interengaging relation to form a coherent web having a marginal region of higher fiber concentration;

advancing the perforated surface with the web thereon across a progressively narrowing opening; and

moving gas through the advancing perforated surface into the opening so as to effect lateral gathering of the fibers of the web together to form a relatively loosely associated longitudinal sliver-like fibrous product having at least a portion of the fibers at each increment of length of the product interengaged into a continuous system of fibers possessing sufficient coherency to establish longitudinal dimensional stability and having fibers of the marginal web region intermittently along the length of the sliver-like product interengaged into a secondary system of fibers bending outwardly of the continuous system between spaced locations along the length of the continuous system to provide non-uniform bulk to the sliver-like product.

3,900,303
METHOD OF MAKING GLASS PRODUCTS

John D. Mackenzie, Los Angeles, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed July 5, 1972, Ser. No. 268,971
Int. Cl. C03c *27/00*
U.S. Cl. 65—18 5 Claims

1. An improved method of making a pressed glass product, which method comprises:

mixing particulate used-container glass together with a glass filling agent, said used-container glass having the following approximate concentration of foreign inclusions mixed therewith:

Inclusions	% by wt. in glass
Fe	0.1 to 3
Sn	0.1 to 2
Al	0.1 to 2
Other metals	0.1 to 1
Cellulosics	0.1 to 1
Other organics	0.1 to 1

said used-container glass having an average reflectance of between about 5 and about 95%;

heating the resulting mix to a temperature and pressure within a range sufficient to sinter and soften said glass and coalesce said filling agent therewith but insufficient to melt said glass;

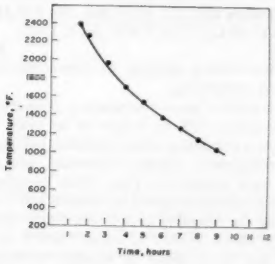
maintaining said mix within said range while pressing at about 10–10,000 p.s.i. until said glass has been converted into a hard glass coherent mass having a multi-colored appearance; and

thereupon cooling said pressed glass to below the solidification point thereof and recovering the finished glass product.

3,900,304
METHOD OF REDUCING H_2S EMISSIONS DURING SLAG QUENCHING

Frederick H. Rehmus, Baldwin, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed May 7, 1973, Ser. No. 358,000
Int. Cl. C03b *19/08*
U.S. Cl. 65—19 13 Claims



1. A method of minimizing H_2S emissions during slag quenching, comprising:

a. successively pouring molten slag increments into a holding pit in such incremental slag layer thicknesses and time intervals between said incremental slag pours that a slag thermal arrest temperature of from about 1200°F to about 1400°F is attained; and

b. quenching said incrementally poured slag with a quenchant which comprises water and an oxidizing agent.

3,900,305
METHOD OF FORMING CONDUCTIVE LAYER ON OXIDE-CONTAINING SURFACES

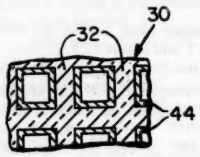
Robert D. DeLuca, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 7, 1973, Ser. No. 358,013
Int. Cl. C23c *13/04*
U.S. Cl. 65—30 16 Claims

1. A method of forming a conductive layer on a surface of an oxide-containing ceramic substrate comprising the steps of providing a substrate of oxide-containing ceramic material that is capable of being reduced by magnesium vapor at temperatures in excess of 300°C, said ceramic material being selected from the group consisting of sinterable ceramics, glasses and glass-ceramics,

disposing said substrate in a reaction chamber having a vacuum system connected thereto for maintaining the pressure in said chamber at 10^{-4} Torr or less,

heating said substrate to a temperature greater than 300°C but less than the deforming temperature thereof, and



providing said chamber with a source of magnesium vapor that is disposed on that side of said substrate opposite said vacuum system connection so that said magnesium vapor flows across and reacts with a surface of said substrate, thereby reducing said surface and forming a conductive cermet thereon.

3,900,306

CATALYTIC CRYSTALLINE GLASS FIBERS AND METHOD

Walter H. Brueggemann, Chagrin Falls, and Jack S. Gilhart, Salem, both of Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Division of Ser. No. 279,210, Aug. 9, 1972, Pat. No. 3,873,328. This application Dec. 23, 1974, Ser. No. 535,187
Int. Cl.[2] B01J *35/06;* **C03C** *3/22, 13/00*
U.S. Cl. 65—33 **8 Claims**

1. A process for forming catalytic, oxidation-inducing crystalline glass fibers comprising:

a. fiberizing a molten glass composition containing from about 10 to about 70% by weight of an oxide selected from the group consisting of an oxidation-inducing oxide of cobalt, manganese, copper, chromium, and mixtures thereof to form amorphous glass fibers containing said oxide substantially throughout the fibers, and

b. heat treating the resulting glass fibers within a temperature range of about 1,000°F to about 1,600°F for a sufficient time and up to about 60 minutes to crystallize a substantial portion of the glass of said fibers, in which said oxidation-inducing oxide becomes a part of the crystalline structure and supplies sites capable of catalyzing oxidation reactions.

3,900,307

COMPOSITION AND METHOD FOR CONTROLLING SUCKERS IN TOBACCO

Walter W. Abramitis, Downers Grove, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Filed Apr. 5, 1973, Ser. No. 348,393
Int. Cl. A01n *9/24*
U.S. Cl. 71—78 **20 Claims**

1. A composition for controlling the growth of suckers in tobacco plants, consisting essentially of:

a. from about 10% to about 75% by weight of an aliphatic monocarboxylic acid diester of an aliphatic glycol selected from the group consisting of an alkylene glycol containing from 2 to 6 carbon atoms, diethylene glycol, and triethylene glycol, said acid having 7 to 15 carbon atoms;

b. from about 0.5% to about 10% by weight of a surfactant; and

c. from about 70% to about 80% of the total weight of the composition of an aliphatic alcohol having 8 to 12 carbon atoms.

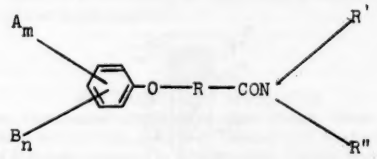
3,900,308

HERBICIDAL MONO AND DISUBSTITUTED AMIDES OF PHENOXYALIPHATIC CARBOXYLIC ACIDS

Pierre Poignant, Lyon, and Pierre Delage, Lentilly, both of France, assignors to Pechiney Progil, France

Continuation-in-part of Ser. No. 862,026, Sept. 29, 1969, abandoned. This application May 25, 1972, Ser. No. 256,652
Int. Cl. A01n *9/20*
U.S. Cl. 71—118 **17 Claims**

1. A method of selective crop cleaning which comprises applying a weed-killing amount of an herbicide composition containing at least one compound of the formula,



wherein R is a linear or branched alkylene group containing 1 to 5 carbon atoms,

R′ is hydrogen or an alkyl group containing 1 to 5 carbon atoms,

R″ is an alkyl group containing 1 to 5 carbon atoms or an alkenyl group containing up to 5 carbon atoms,

A is halogen,

B is an alkyl group containing 1 to 3 carbon atoms or an halogenated alkyl group containing 1 to 3 carbon atoms and

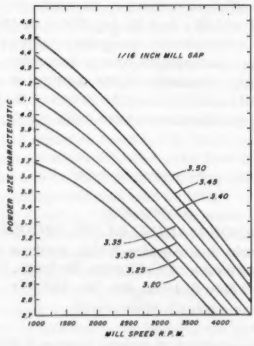
m and *n* are integers of 0 to 3, $m + n$ being no more than 3 and the substituents A and B being in positions 2, 3, 5 and 6 of the phenyl radical provided that when $n = 1$ and $m = 0$, B is not in position 2.

3,900,309

PROCESS FOR THE PRODUCTION OF HIGH APPARENT DENSITY WATER ATOMIZED STEEL POWDERS

Hung-Chi Chao; John H. Gross, both of Monroeville; Robert R. Judd, and Roger L. Rueckl, both of Murrysville, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 16, 1973, Ser. No. 389,603
Int. Cl.[2] B22F *1/04*
U.S. Cl. 75—0.5 BA **6 Claims**



1. A method for the production of molding grade steel powders with high apparent densities, which comprises,

a. providing as-water-atomized steel particles with a prescribed size distribution, wherein at least 80% of said

particles are finer than 80 mesh and said distribution exhibits a PSC value of between 2.0 to 4.0,

b. annealing said particles at a temperature within the range of 1400°–2100°F for a time at least sufficient to (i) effect the desired softening thereof, and (ii) reduce the oxygen content thereof to a value below about 0.2 weight percent, said annealing causing said particles to sinter together,

c. feeding the annealed, sintered particles to a disk mill operated at a speed of between about 200 to 5000 revolutions per minute and a mill gap of between about 0.01 to 0.10 inches, wherein the linear speed v of said disks is sufficiently high and the mill gap G is sufficiently close to grind said sintered particles to molding grade powders with an apparent density in excess of 3.2 gm/cc, substantially all of which are finer than 80 mesh.

3,900,310

PROCESS FOR SUSPENSION SMELTING OF FINELY-DIVIDED OXIDE AND/OR SULFIDE ORES AND CONCENTRATES

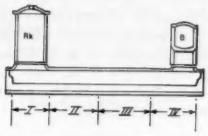
Kauko Johannes Kaasila, Haukilahti; Toivo Adrian Toivanen; Seppo Untamo Harkki, both of Harjavalta; Toivo Isak Neimela, Otaniemi; Simo A. Makipirtti, Harjavalta; Rolf E. Malmstrom, Pori; Tapio Kalevi Tuominen, Pori; Olavi August Aaltonen, Pori, and Veikko H. Noponen, Harjavalta, all of Finland, assignors to Outokumpu Oy, Outokumpu, Finland

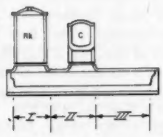
Filed Sept. 18, 1972, Ser. No. 289,635

Claims priority, application Finland, Sept. 19, 1971, 2610/71

Int. Cl. C22b *15/02*

U.S. Cl. 75—23 **4 Claims**





1. An improved process for the suspension smelting of finely-divided oxide or sulfide ores and concentrates within primary and secondary reaction zones, wherein a suspension of finely-divided raw material in pre-heated air, oxygen or both is fed downwards at a temperature of at least the reaction temperature of a primary reaction zone formed by the suspension and the smelt underneath to oxidize and partially smelt the suspension raw material, whereafter the oxidized raw material is partially sulfidized and the suspension flow is deflected perpendicularly so that the bulk of the raw material in the suspension flow impinges against the surface of the accumulated smelt in a main smelt reaction zone under the primary reaction zone and the remaining suspension flow is fed into a rising-flow zone, and the solids to be returned to the reaction zone are separated from the residual suspension flow, the improvement comprising feeding the remaining suspension flow passing the primary reaction zone into the secondary reaction zone so that its partial dissolution in the smelt in said secondary reaction zone does not exceed five percent by weight of the total shaft product before essentially all undissolved remaining suspension is fed into the rising-flow zone in order to prevent the remaining suspension from affecting a smelt settling zone which is communicating at least through the smelt with the main and secondary smelt reaction zones and in which slag is separated from the matte and metal.

3,900,311

CONVERSION OF PIG IRON INTO STEEL

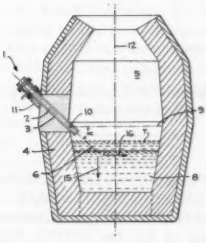
Paul Emile Nilles, Embourg, Belgium, assignor to Centre de Recherches Metallurgiques, Brussels, Belgium

Filed Nov. 3, 1972, Ser. No. 303,357

Claims priority, application Belgium, Nov. 3, 1971, 774886

Int. Cl. C21c *5/32*

U.S. Cl. 75—60 **6 Claims**



1. A refining process for the conversion of pig iron into steel in a converter wherein the molten metal is agitated by blown oxygen so as to better distribute the oxygen throughout the melt and control the decarburization, the converter having a bottom, a side wall, and at least one tuyere in the side wall, the tuyere comprising an inner conduit and an outer conduit surrounding the inner conduit, the process including the steps of injecting substantially pure oxygen through said inner conduit onto the molten metal in the converter, and injecting a protective fluid through the outer conduit, the tuyere opening into the converter through the sidewall at the level of the zone occupied by slag and the axis of the tuyere being inclined towards the converter bottom to create rotational movement of the molten metal.

3,900,312

REDUCTION OF ALUMINUM CHLORIDE BY MANGANESE

John Christopher Terry; Alfred Lippman; Roger Frank Sebenik, and Harry Gordon Harris, Jr., all of Matairie, La., assignors to Toth Aluminum Corporation, New Orleans, La.

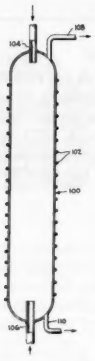
Filed Oct. 16, 1972, Ser. No. 297,695

Int. Cl. C22b *21/02*

U.S. Cl. 75—68 B **5 Claims**

1. A process for producing aluminum in essentially elemental form comprising the steps of providing aluminum chloride, which chloride is in a liquid phase; providing elemental manganese in solid phase; reacting said liquid aluminum chloride and elemental manganese in a vessel at a pressure and at a

temperature up to 350°C at which they will maintain their respective phases, the elemental manganese reducing the



liquid aluminum chloride and forming essentially elemental aluminum and manganese chloride.

3,900,313

PROCESS FOR PRODUCING DIE-CASTING ALLOYS FROM ALUMINUM SCRAP

Hubert Martin, 4720 Shoremeade Rd., Richmond, Va. 23234

Continuation-in-part of Ser. No. 289,597, Sept. 18, 1972, abandoned. This application Feb. 2, 1973, Ser. No. 329,143

Int. Cl. C22b *21/06*

U.S. Cl. 75—68 R **5 Claims**

1. A method for the conversion of scrap aluminum alloy to die-casting alloys, the scrap alloy containing at least 70 weight percent aluminum and one or more impurities in iron, titanium, calcium, manganese, copper, magnesium, zinc, nickel, chromium, phosphorus, comprising the steps of melting said scrap aluminum alloy, adding and dissolving in said aluminum alloy sufficient silicon to obtain between 7.5 to 20 percent silicon in the melt, cooling the melt to cause formation of one or more solid intermetallic crystalline phases lower in aluminum content than the remaining liquid aluminum alloy but higher than said scrap aluminum alloy in at least one of said impurities, further cooling the melt at such a rate and for sufficient time to cause coarsening of said crystalline phases while keeping them suspended in the liquid alloy, separating said coarsened crystals from said melt and recovering at least the remaining liquid aluminum alloy.

3,900,314

PROCESS FOR RECOVERING DISSOLVED COPPER FROM SOLUTIONS CONTAINING COPPER

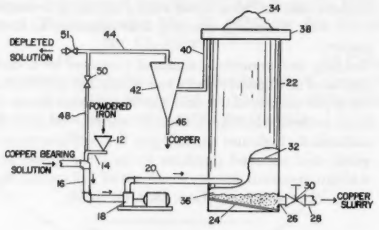
Jan Hulsebos, Cranbury, N.J., assignor to Cities Service Oil Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 128,435, March 26, 1971, abandoned. This application Sept. 29, 1972, Ser. No. 293,616

Int. Cl. C22b *15/12*

U.S. Cl. 75—109 **9 Claims**

1. In the process of recovering copper values from solutions containing the same, wherein powdered iron is used to reduce copper in the solution to metallic copper, the improvement which comprises mixing powdered iron with the copper bearing solution in a highly turbulent mixing zone, and reducing the flow velocity of the solution containing the metallic copper by tangentially discharging from the turbulent mixing zone to a settling zone permittting the solution to flow circumferentially in the settling zone and for the copper to settle to the bottom of said zone, passing said solution from the settling zone upwardly through a bed of scrap iron, said scrap iron



acting to trap entrained metallic copper and to displace remaining copper values dissolved in the solution.

3,900,315

NICKEL-CHROMIUM-IRON ALLOY

Udo Walter Vogt, and Sven G. Waher, both of Sandviken, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Feb. 15, 1974, Ser. No. 443,097

Claims priority, application Sweden, Feb. 20, 1973, 7302336

Int. Cl.² C22C *38/06, 38/50*

U.S. Cl. 75—124 **12 Claims**

1. Nickel-chromium-iron alloy having excellent resistance to oxidation at rapid cyclic temperature variations, high creep strength and good structure stability, said alloy having a composition consisting essentially of in % by weight: 0.02 – 0.15 % Cr; 18 – 24 % Cr; 22 – 31 % Ni; 1.1 – 2.5 % Al; 0.1 – 0.8 % Ti; 0.3 – 1.2 % Si; 0.3 – 2.0 % Mn, and the remainder Fe besides normally present impurities.

3,900,316

CASTABLE NICKEL-CHROMIUM STAINLESS STEEL

Robin Mackay Forbes Jones, Suffern, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 275,095, Aug. 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 182,219, Sept. 20, 1971, abandoned. This application Mar. 7, 1973, Ser. No. 337,278

Int. Cl.² C22C *38/02, 38/08, 38/54, 38/58*

U.S. Cl. 75—128 A **16 Claims**

1. An austenitic nickel-chromium stainless steel consisting essentially of 6% to about 28% nickel, about 14% to about 25% chromium, 2% to about 5% silicon, 0.3% to about 0.7% boron, up to about 0.15% carbon, up to about 20% manganese, up to about 3% copper, up to about 8% molybdenum, up to about 1% columbium and balance iron and wherein the amounts of nickel, chromium, silicon, and boron and any manganese and molybdenum in the alloy are correlated in accordance with the relationship

$$8(\%Ni+\%Mn)-1.5(\%Cr+\%Mo)+22(\%Si+284(\%B) \text{ equal at least } 360;$$

said steel being characterized by castability superior to that of austenitic steels of the A.C.I. CF-8 type, as determined by relative freedom from cold shut defects when cast in three-sixteenths-inch thick by 1½-inch interlocking squares in green sand molds according to the Chinese Puzzle pattern, and additionally characterized by corrosion resistance superior to that of martensitic-ferritic steels of the A.C.I. CA-15 and CB-30 types, as determined by resistance to pitting and general corrosion in salt-spray CASS tests corresponding to ASTM B368-61T.

3,900,317

Fe-Sn-Cu-Pb SINTERED COMPOSITE METAL ARTICLE AND PROCESS

Frederick W. Meadus; Bryan D. Sparks, and Ira E. Puddington, all of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 6, 1973, Ser. No. 338,563
Int. Cl. C22c 1/04; B22f 7/00
U.S. Cl. 75—211 8 Claims

1. A method of preparing a composite iron-lead article from metal powders comprising iron particles in about 25 to about 90% wt.; a metal selected from the group consisting of tin, copper or mixtures thereof in up to about 5%; and the balance substantially all lead powder, including:

a. incorporating iron particles with the other metal powders to form a composite mixture;

b. shaping the metal mixture into the desired article;

c. sintering and partially-alloying between the iron particles and the other metals in a reducing atmosphere, the iron being substantially un-alloyed except at the surfaces thereof but wetted and bonded by an alloy of the other metals; and

d. subjecting the sintered article to mechanical compaction to further increase the density over that obtained in step (c).

3,900,318

USE OF SUBLIMABLE DISPERSE DYES IN PHOTOELECTROPHORETIC IMAGE REPRODUCTION

Georgeos Zographos, Zurich, and Peter Mockli, Basel, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed May 14, 1973, Ser. No. 360,234
Claims priority, application Switzerland, May 23, 1972, 007595/72
Int. Cl. G03g 13/06
U.S. Cl. 96—1.3 4 Claims

1. In a process for producing an image by the photoelectrophoretic image reproducing system, comprising the steps of (a) irradiating with light a volatile liquid dyestuff suspension, causing migration of said dyestuff in said suspension from an injector electrode to a blocking electrode, (b) evaporating the volatile liquid to leave a powder dyestuff image on the injector electrode or the blocking electrode or both and, (c) fixing the image, the improvement comprising using as said dyestuff a disperse dye or a mixture of disperse dyes which can be converted into the vapor state at temperatures between 160°C and 220°C under atmospheric pressure.

3,900,319

ELECTROSTATOGRAPHIC COPY PAPER CONTAINING GLYCIDYL QUATERNARY AMMONIUM COMPOUNDS

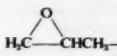
Lewis S. Miller, 10260 S.E. 21st St., Bellevue, Wash. 98004

Division of Ser. No. 187,211, Oct. 6, 1971, Pat. No. 3,798,032.
This application Dec. 26, 1973, Ser. No. 427,503
Int. Cl.[2] G03G 5/00
U.S. Cl. 96—1.8 8 Claims

1. An electroconductive paper useful as a base for producing electrostatographic copy paper comprising a paper sheet coated with an electroconductive layer comprising an organic, film-forming polymer and a monomeric quaternary ammonium compound of the formula:

$$[R_4{}^1 - N - R_{(4-4)}{}^{11}]\ B$$

wherein R^1 is



R^{11} is CH_3— or CH_3CH_2—; A is 1, 2 or 3; and B is a chloride, fluoride or bromide anion.

3,900,320

ACTIVATION METHOD FOR ELECTROLESS PLATING

John H. Rolker, Altadena, and Bradley A. Carson, Monrovia, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Sept. 30, 1971, Ser. No. 185,106
Int. Cl. B44d 1/092; C23c 3/02
U.S. Cl. 96—35.1 7 Claims

1. A method for forming a metal image on an organic polymer base, which comprises:

combining in solution a metal-containing component capable of forming catalytic bonding sites for an electroless metal plating process, photosensitive polymerizable binder material and at least one solvent for said binder material and said component, the weight ratio of said binder material to the metal portion of said metal-containing component in said combination being from about 0.3:1 to about 15:1, said combination having a viscosity, under the conditions of its application to said base, equivalent to a Newtonian fluid viscosity of about 0.2 to about 100 centipoises;

applying said combination to said base and drying at a temperature of 20°–150° so as to form a layer thereof about 20 A to about 3000 A thick on said base;

photographically exposing said layer to form solvent-resistant polymerized image portions on said plate against a solvent-soluble background;

thereafter treating said layer with solvent to remove said background; and

thereafter electrolessly plating said image portions to form said metal image.

3,900,321

SILVER HALIDE EMULSION CONTAINING AROMATIC AZOCARBONAMIDE ANTIFOG AGENT

Alan Norman Ferguson, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 2, 1972, Ser. No. 293,772
Claims priority, application United Kingdom, Oct. 18, 1971, 47056/71
Int. Cl. G03c 1/48, 1/34
U.S. Cl. 96—76 R 10 Claims

1. A silver halide photographic emulsion which has in fog inhibiting reactive association therewith at least a fog inhibiting amount of an azocarbonamide having one azo-carbonamide group.

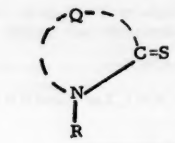
3,900,322

DIFFUSION TRANSFER COLOR PHOTOGRAPHIC MATERIAL HAVING DEVELOPEMENT INHIBITOR PRECURSOR

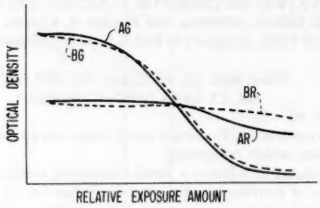
Yasushi Oishi; Jun Hayashi, and Yoshinobu Yoshida, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Oct. 11, 1972, Ser. No. 296,698
Claims priority, application Japan, Oct. 12, 1971, 46-80393
Int. Cl.[2] G03C 1/40, 7/00, 5/54, 1/48
U.S. Cl. 96—77 13 Claims

1. A diffusion transfer color photographic material comprising a support having thereon at least two layers each containing a dye developer, and having thereon at least two silver halide photographic emulsion layers, at least one of said silver halide photographic emulsion layers containing a compound represented by general formula I



(I)



wherein Q represents an atomic group necessary for forming a heterocyclic ring, and R represents an unsubstituted alkyl group, an alkyl group substituted by a hydroxyl group, an aryl group or a morpholino group, an unsubstituted aryl group, an aryl group substituted by an alkyl group, an alkoxy group or a halogen atom or a heterocyclic group, said compound being capable of releasing a diffusible development inhibitor upon development of exposed silver halide by said dye developer, thereby causing imagewise release of said inhibitor upon development of said emulsion layers subsequent to exposure thereof.

3,900,323

PHOTOGRAPHIC ELEMENT COMPRISING AN OPAQUE BACKCOAT

William T. MacLeish, North Andover, and Terry W. Milligan, Belmont, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 23, 1973, Ser. No. 408,374
Int. Cl.[2] G03C *1/84*
U.S. Cl. 96—84 R **7 Claims**

1. A photographic element which includes at least one silver halide emulsion layer and which also includes a layer containing carbon black and a water-soluble salt of a heavy metal capable of forming a relatively insoluble sulfide.

3,900,324

TREATMENT OF SYNTHETIC POLYESTER FILM PRODUCTS

Raphael Landau, Woodford Green, England, assignor to Ozalid Company, Ltd., Loughton, England

Filed June 25, 1972, Ser. No. 283,667
Int. Cl. B44d *1/40*
U.S. Cl. 96—87 R **17 Claims**

1. A process for sensitising to actinic radiation a film consisting of polyester resin without pretreatment of the film, which consists in applying to the surface of the film a solution or dispersion, in a liquid organic solvent medium which evaporates upon heating to a temperature not exceeding 150°C., of a diazonium compound and a coupler, said solution or dispersion consisting essentially of said solvent and a halogenated compound selected from the group consisting of halogenated acetic acids, halogenated propionic acids fully halogenated acetaldehyde hydrate and fully halogenated acetaldehyde, in an amount sufficient to cause penetration into and deposition in the film of the diazonium compound and the coupler, and thereafter heating the film to effect evaporation of the medium, an acid also being present when said halogenated compound is said fully halogenated acetaldehyde.

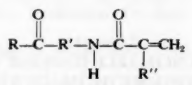
3,900,325

LIGHT SENSITIVE QUINONE DIAZIDE COMPOSITION WITH N-3-OXOHYDROCARBON SUBSTITUTED ACRYLAMIDE

Carl W. Christensen, and Calvin M. Isaacson, both of Beverly, Mass., assignors to Shipley Company, Inc., Newton, Mass.

Continuation-in-part of Ser. No. 261,982, June 12, 1972, abandoned. This application Nov. 6, 1972, Ser. No. 304,111
Int. Cl. G03f *7/08*; G03c *1/54*
U.S. Cl. 96—91 D **9 Claims**

1. A positive working photoresist composition comprising an ortho quinone diazide sulfonyl ester light sensitive compound, an acrylic terpolymer resin wherein one of the monomers of the terpolymer is selected from the group consisting of methyl acrylate, ethyl acrylate, and propyl acrylate, wherein a second monomer of the terpolymer is selected from the group consisting of p-methyl styrene, p-chlorostyrene, p-ethyl styrene and styrene, and the third monomer of the terpolymer is selected from the group consisting of acrylic acid, methacrylic acid, and maleic acid, wherein the weight percent of said third monomer is 3–15% by weight as based on the total weight of the monomers of said acrylic terpolymer resin, and an N-3-oxohydrocarbon substituted acrylamide, the ratio of said acrylic resin to said acrylamide being between 100:1 parts acrylic resin to acrylamide to 1:2 parts acrylic resin to acrylamide on a weight basis, and said light sensitive compound comprising up to 40% by weight of the photoresist composition on a dry solids basis, and said acrylamide being represented by the formula:



wherein R and R'' are each selected from the class consisting of hydrogen and lower alkyl radicals and R' is selected from the class consisting of ethylene and a lower alkyl-substituted ethylene radical.

3,900,326

PROCESS AND APPAPATUS FOR HEATING UP AND THERMOSTATING SOLUTIONS OF HIGH SOLIDS CONTENT FOR COATING OF WEB MATERIALS AT A GIVEN TEMPERATURE AND FOR LOWERING THE VISCOSITY OF SUCH SOLUTIONS WHICH HAVE A STRUCTURAL VISCOSITY

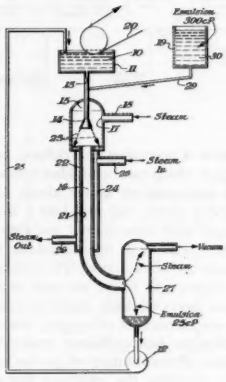
Peter Herzhoff, Leverkusen; Hans Gref, Cologne-Stammheim; Fritz Maus, Cologne-Flittard; Stephan Platz, Leverkusen; Josef Friedsam, Langenfeld; Wolfgang Schweicher, Leverkusen; Rolf Behr, Leverkusen; Willi Wasser, Leverkusen, and Kurt Browatzki, Opladen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 860,039, Sept. 22, 1969, abandoned. This application July 2, 1973, Ser. No. 375,498
Int. Cl. G03c *1/74*
U.S. Cl. 96—114.8 **4 Claims**

1. In a continuous process for providing a flowable gelatino-silver halide emulsion having a viscosity in the range of 2–100 cp for casting on a moving substrate by treating a gelatino-silver halide emulsion introduced into the process to reduce the emulsion viscosity, said viscosity being 20–400 cp at room temperature while substantially maintaining the aqueous content of the emulsion, the steps comprising:

introducing a gelatino-silver halide emulsion having a viscosity of 20–400 cp and an aqueous content sufficient to provide flowability into the head of an evaporator column and regulating the pressure in the head to between 60–200 mm Hg and a temperature between 42°–67°C, injecting into the emulsion from the head and under the pressure and temperature of the head ballast steam at a high steam velocity from an external source and mixing the steam up in the emulsion under a high shearing force

of the ballast steam on the emulsion so that steam becomes entrained in the emulsion, flowing the emulsion in a thin film downwardly over a surface while being subject to a shearing gradient in the evaporator column from the head and under a pressure in the column of between 30–60 mm Hg and a temperature of between 29°–42°C, condensing in the downwardly flowing emulsion part of the entrained steam in the emulsion under the conditions of lower temperature and pressure in the column than in



the head so that water from the condensed steam is incorporated in said emulsion,

and separating the processed emulsion of reduced viscosity and the steam in a stage under a condition of equilibrium between temperature and steam pressure, and continuously recovering emulsion from the separating stage in a composition having a viscosity at room temperature of 2–100 cp and an aqueous content substantially the same as the initially introduced emulsion.

3,900,327

FLAME RETARDANT CELLULOSIC MATERIALS

George T. Miller, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Oct. 12, 1973, Ser. No. 405,962

Int. Cl. C09d *5/18*

U.S. Cl. 106—15 FP **13 Claims**

1. Fire retardant cellulosic containing material which material contains an effective fire retardant amount of a reaction product of aqueous ortho phosphoric acid or an acid ammonium salt thereof and an alkylene oxide wherein said reaction product has been obtained by reacting an aqueous solution of a ortho phosphoric acid or an acid ammonium salt thereof containing from about 1 to about 85 percent by weight of ortho phosphoric acid or the equivalent amount of an acid ammonium salt thereof with an amount of an alkylene oxide which is from about 0.5 to 1.5 times the weight of 100 percent phosphoric acid or equivalent thereof present, intimately associated therewith.

3,900,328

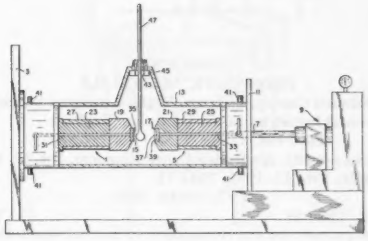
METHOD AND APPARATUS FOR MOLDING GLASS LENSES

William F. Parsons; Gerald E. Blair, and Clarence C. Maier, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 93,336, Nov. 27, 1970, abandoned. This application Mar. 12, 1973, Ser. No. 340,510

Int. Cl. A44c ; C03b *9/14*

U.S. Cl. 106—39.5 **31 Claims**



1. A method of molding glass which comprises pressing a heat softened glass against a molding surface of glasslike carbon, the glasslike carbon being a form of carbon which has been prepared by the thermal degradation of an organic polymer, which is substantially chemically inert with heated glass and which is isotropic.

3,900,329

GLASS COMPOSITIONS

Everett F. Grubb, Toledo; Erwin C. Hagedorn, Oregon, and Joseph R. Monks, Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 512,235, Dec. 7, 1965, Pat. No. 3,524,738. This application Oct. 23, 1969, Ser. No. 871,386

Int. Cl. C03c *3/04*

U.S. Cl. 106—52 **2 Claims**

1. A glass having an oxide composition consisting essentially, on a percent by weight basis, of

SiO_2	51–63
Al_2O_3	15–22
Total CaO + MgO expressed as CaO mole equivalent	10–22
Na_2O	3.5 – 10
K_2O	0 – 5
Total alkali metal oxide present as Na_2O or a mixture of Na_2O and K_2O expressed as Na_2O mole equivalent [5–15]	7 – 14

and the log viscosity of the glass at its liquidus temperature is at least 2.8, the liquidus of the glass compositions ranges from 2,060°F to about 2,320°F and the cooling time ranges from about 55 to 66 seconds.

3,900,330

ZnO-B_2O_3-SiO_2 GLASS COATING COMPOSITIONS CONTAINING Ta_2O_5 AND A SEMICONDUCTOR DEVICE COATED WITH THE SAME

Toshiro Moriguchi; Kiyoshi Miwa, and Takehiro Shibuya, all of Tokyo, Japan, assignors to Nippon Electric Glass Company, Limited, Tokyo, Japan

Filed Mar. 22, 1973, Ser. No. 343,642

Int. Cl. C03c *3/08, 3/30, 7/00*

U.S. Cl. 106—54 4 Claims

1. A glass coating composition consisting of, by weight, 45–70% ZnO, 15–35% B_2O_3, 3.5–15% SiO_2 and 0.1–25% Ta_2O_5, said coating composition when disposed on a semiconductor device having the capacity to induce positive electric charges on the surface of said device.

3,900,331

PHOSPHATIC MATERIALS

John Edward Cassidy, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 12, 1972, Ser. No. 296,984

Claims priority, application United Kingdom, Oct. 19, 1971, 48574/71; Feb. 21, 1972, 7844/72

Int. Cl.[2] C04B *19/00*

U.S. Cl. 106—85 13 Claims

1. A process for the preparation of a solid water-soluble aluminium phosphate which comprises spray-drying or freeze-drying a solution containing aluminium ions, phosphate ions and additionally the anions of a mineral acid other than phosphoric acid or of a carboxylic acid, the aluminium ions and phosphate ions being present in solution in a ratio of substantially 1:1.

3,900,332

LIGHTWEIGHT CEMENT COMPOSITIONS FOR BUILDING AND OTHER PURPOSES

Matthew L. Davis, 8399 Hough Ave., Cleveland, Ohio 44103

Filed Aug. 6, 1973, Ser. No. 385,731

Int. Cl. C04b *7/02*

U.S. Cl. 106—97 6 Claims

1. A mixture for use in making waterproof concrete, said mixture consisting of from 44.14 to 67.63% by weight of crushed coke coated with a thermosetting resin in an amount constituting an additional 0.87 to 1.31% of the mixture, 29.78% to 44.68% portland cement, and not in excess of 6.38% lime.

3,900,333

MORTARS AND THE LIKE

Karl Knauf, Iphofen, Germany, assignor to Gebruder Knauf Westdeutsche Gipswerke, Iphofen, Germany

Filed Dec. 29, 1972, Ser. No. 319,393

Claims priority, application United Kingdom, Jan. 3, 1972, 195/72

Int. Cl. C04b *11/00*

U.S. Cl. 106—109 2 Claims

1. Particulate anhydrite, of whose particles from about 2 to 6% by weight have a particle size greater than about 5 mm, from about 13 to 23% by weight have a particle size of from about 5 to 3.15 mm, from about 33 to 40% by weight have a particle size of from about 3.15 to 1 mm, from about 17 to 23% by weight have a particle size of from about 1 to 0.2 mm, and from about 17 to 33% by weight have a particle size less than about 0.2 mm.

3,900,334

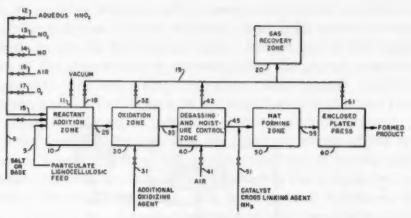
LIGNOCELLULOSIC MOLDING METHOD AND PRODUCT

David L. Brink, Berkeley, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 133,688, April 13, 1971, abandoned. This application Sept. 27, 1973, Ser. No. 401,444

Int. Cl. C08b *23/00, 27/24, 27/52*

U.S. Cl. 106—163 17 Claims



1. A method of preparing an oxidized, particulate, lignocellulosic product which can be molded between plates in a press at elevated temperatures above about 100°C and elevated pressures above about 100 psig into a shaped article having good strength and dimensional stability, which comprises oxidizing the particulate, lignocellulosic material at an elevated temperature above about 0°C with at least one of nitric acid and oxygen gas in an amount and under conditions whereby said lignocellulosic material consumes from about 1.25 to 25 weight percent of oxygen, based on the dry weight of the particulate lignocellulosic material, and terminating such oxidation after evolution of gas has substantially ceased, followed by molding the oxidized lignocellulosic material between plates in a press under said elevated pressure and temperature above 100°C to effect cross-linking within the materials and densify the same and to reduce the moisture content in the molded product to below about 10 percent.

3,900,335

PAPER SIZING

Heinz Beck, Nideggener, Germany, assignor to Akzo N.V., Arnhem, Netherlands

Filed Apr. 1, 1974, Ser. No. 456,614

Claims priority, application Germany, Apr. 14, 1973, 2318894

Int. Cl. C08b *25/02, 27/52*

U.S. Cl. 106—213 12 Claims

1. A stable sizing agent for paper comprising:
a. water;
b. an emulsifying agent; and
c. as the active sizing component an N,N′-alkyl-substituted aspartimide in which at least one alkyl substituent consists essentially of an alkyl chain of at least 16 up to about 40 carbon atoms.

3,900,336

NOVEL AUTOXIDIZABLE LIQUIDS

Frederick John Lubbock, Beaumaris, and Livia Polgar, Caulfield, both of Australia, assignors to Dulux Australia Ltd., Melbourne, Australia

Filed Apr. 25, 1974, Ser. No. 464,234

Claims priority, application Australia, May 18, 1973, 3366/73

Int. Cl.[2] C09D *3/26*

U.S. Cl. 106—252 3 Claims

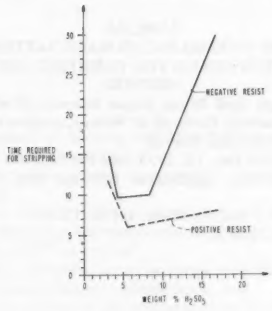
1. A liquid, non-polymeric, autoxidizable monocarboxylic fatty acid ester of a polyhydric alcohol, characterised in that the ester comprises on average 3.5–4.5 autoxidizable fatty acid residues and 0.8–1.4 acrylyl or methacrylyl residues per

molecule, has an acid value of 45–75 mgm KOH per gm provided by carboxyl groups attached thereto and a molecular weight of 1500–3000.

3,900,337
METHOD FOR STRIPPING LAYERS OF ORGANIC MATERIAL

Wolfgang Beck, Boeblingen; Friedrich C. Brunner, Sindelfingen; Peter U. Frasch, Boeblingen; Blanka Ivancic, Boeblingen; Friedrich W. Schwerdt, Boeblingen, and Theodor Vogtmann, Holzgerlingen, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 5, 1974, Ser. No. 458,254
Int. Cl.[2] H01L *21/312;* **C09K** *13/04*
U.S. Cl. 134—3 **8 Claims**



1. Method for stripping layers of organic material from the surface a substrate which is resistant to oxidizing acids comprising:

providing a mixture of H_2SO_4 and H_2O_2 in a ratio of at least about 15:1, acid to peroxide, referring to volume quantities of the anhydrous chemical substances, using at least 95% by weight sulphuric acid and an at least 30% H_2O_2 by weight aqueous H_2O_2 solution; and immersing said substrate in said mixture.

3,900,338
WATER SOLUBLE BLOCK POLYMERS USED AS SILT CONTROL AGENTS

Regis Robert Rumpf, Coraopolis; David Elmer Farley, Oakdale, and Lawrence James Guilbault, McMurray, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

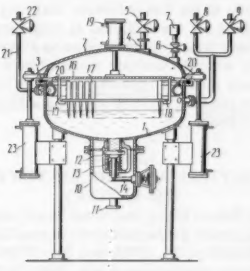
Filed Apr. 30, 1974, Ser. No. 465,716
Int. Cl.[2] B08B *9/00;* **C02B** *1/20, 5/06*
U.S. Cl. 134—22 R **2 Claims**

1. A method of removing alluvium and silt deposits and inhibiting the deposition of alluvium and silt in aqueous systems comprising adding to the water in said aqueous system at least 0.05 ppm of a polymer of the formula A-B-A wherein the A block represents from 10 to 100,000 mer units of acrylamide and the B block represents from 10 to 5,000 mer units of N-vinylpyrrolidone, flowing said water in contact with the deposits in said system thereby forming a flock and flushing said water containing said flock out of said system.

3,900,339
METHOD FOR WASHING A VESSEL IN A HERMETICALLY CLOSED CHAMBER

Nikolai Andreevich Filipin, V.O. Nalichnaya ul., 36, korpus 6, kv. 110; Jury Vladimirovich Alexander, Naberezhnaya reki Fontanki, 165, kv. 13; Jury Alexandrovich Poddubny, Pushkin, Shkolny pereulok, 29, kv. 24; Valentin Sergeevich Mozhzhukhin, ul. Sofii Kovalevskoi, 5, korpus 4, kv. 45, all of Leningrad, and Petr Petrovich Neugodov, Novye Cheremushki, kvartal 34a, korpus 8, kv. 51, Moscow, all of U.S.S.R.

Filed July 7, 1972, Ser. No. 269,585
Int. Cl. B08b *3/00, 9/00*
U.S. Cl. 134—22 R **4 Claims**



1. A method of washing a vessel with an open neck, comprising:

a. placing a vessel in a hermetically closed chamber with its neck facing downwardly,

b. filling said chamber and the internal space of said vessel with steam by feeding the steam into the chamber to expel air therefrom and surround the vessel with steam,

c. filling the chamber with washing liquid to a level above the neck of the vessel,

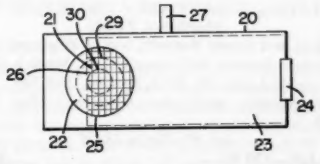
d. again introducing steam into said chamber this time at a sufficiently high temperature and pressure to increase the pressure of the steam in the vessel and cause condensation of this steam whereby the vessel becomes filled with the washing liquid which replaces the thus condensed steam and

e. condensing the steam in said chamber around the vessel by cooling the steam in the chamber which reduces the pressure within the vessel to effect boiling of the washing liquid inside said vessel and its consequent removal therefrom.

3,900,340
GALVANIC CELL STRUCTURES EMPLOYING COILED ELECTRODES

Sheridan H. Greaser, North Olmsted, and Edwin T. Russell, Avon Lake, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 13, 1973, Ser. No. 415,318
Int. Cl. H01m *37/00*
U.S. Cl. 136—13 **14 Claims**



1. A galvanic cell comprising, in combination, an electrically conductive cylindrical can closed at one end and opened

at the other end; a coiled electrode assembly disposed within said can and comprising an elongated sheet of the innermost wound electrode material of a first polarity electrode material, an elongated sheet of a second polarity electrode material and at least two separators all of which are helically wound about each other so that said at least one separator is interposed between said first polarity electrode material and said second polarity electrode material, and at least one separator is disposed about the outer circumference of the wound assembly; an electrolyte disposed in said can at least between said first and second electrodes; a cover for said can; an insulating member interposed between the cover and the upper wall of the can such that a seal is formed between said can and said cover; an electrically conductive means secured to the sheet of the innermost wound electrode material and secured to the cover thereby adopting said cover as the first terminal for the cell; and at least one opening disposed in the outermost separator so as to expose a portion of the outermost wound electrode material such that said exposed electrode material contacts the inner wall of the can with sufficient pressure thereby adopting said can as the second terminal of said cell.

3,900,341

STORAGE BATTERY AND PROCESS FOR PRODUCING THE BATTERY

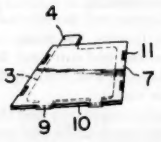
Ito Shoichiro; Tokuzi Ohya, and Shozi Nagai, all of Takatsuki, Japan, assignors to Yuasa Battery Company Limited, Japan

Filed June 21, 1973, Ser. No. 372,039

Claims priority, application Japan, July 12, 1973, 82774/47

Int. Cl.[2] H01M *4/73, 2/18*

U.S. Cl. 136—54 **5 Claims**



1. A lead-acid type storage battery comprising: micro-pores an envelope type separator formed by a folded micro-porous sheet made of a synthetic resin having between several **10,000** to several 100,000,000 micro-pores per cm^2, with the diameter of such mirco-pores being in a range between 100 A to several μ, and said folded micro-porous sheet having portions of at least one of its sides heat-sealed together and having slits in its folded section; and,

a battery plate housed within said envelope type separator, said battery plate having at least one leg; said slits within said micro-porous sheet being arranged so as to leave a sufficient portion of the folded section of said sheet for forming a protective cover for said leg of said battery plate; and said slits being arranged to enable active material generated during battery operation to drop from said battery plate without accumulating at the bottom of said separator.

3,900,342

SILVER CATALYST AND A METHOD OF ITS MANUFACTURE

Karl Hohne, and Renate Bogusch, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

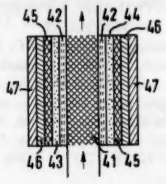
Filed Apr. 28, 1972, Ser. No. 248,386

Claims priority, application Germany, May 3, 1971, 2121748

Int. Cl. H01m *13/00*

U.S. Cl. 136—120 FC **10 Claims**

1. A silver catalyst suitable for use as a fuel cell electrode material comprising an unleached composite of predominantly metallic silver disposed on two or more commingled hydroxides of bismuth, cobalt, iron, nickel and titanium, in which the total metal content of said hydroxides is in the range



of from about 0.5 to about 5 weight %, based on the amount of silver in the finished composite.

3,900,343

METHOD OF ASSEMBLING STORAGE BATTERIES AND INJECTION MOULD FOR CARRYING OUT THE METHOD

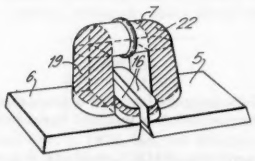
Gunnar Bergh; Kjell Brass; Jorgen Hessner, all of Oslo, and Thomas Varberg, Hosle, all of Norway, assignors to Sonnak Batterier A/S, Oslo, Norway

Filed Dec. 10, 1973, Ser. No. 423,403

Claims priority, application Norway, Dec. 12, 1972, 4572/72

Int. Cl. H01m *13/10, 35/32*

U.S. Cl. 136—134 R **8 Claims**

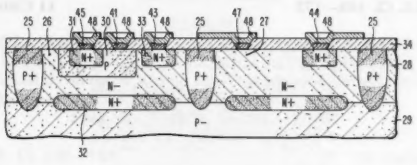


1. A process for assembling a multicell storage battery comprising a thermoplastic container having at least one internal partition for dividing the container into a plurality of compartments, said partition having an opening in its upper portion comprising the steps of forming a one-piece unit comprising positive and negative plates, at least one bridge for retaining edge of said positive and negative plates respectively and at least one connector joining bridges of opposite polarity between said compartments, inserting said one-piece unit into said container such that said connector is within the opening in said partition, placing the open side of a one-piece mould over said connector and a portion of said partition immediately surrounding said opening in such a manner as to establish a tight seal between said open side, the lower portion of said connector and said partition portion thereby forming the bottom of an injection mould from the lower portion of said connector and said partition portion, injecting a thermoplastic material into said mould thereby forming a creep current-resistant seal around said connector and restoring said partition, removing said one-piece mould, positioning a cover of said container and securing said cover to said container.

3,900,344
NOVEL INTEGRATABLE SCHOTTKY BARRIER STRUCTURE AND METHOD FOR THE FABRICATION THEREOF

Ingrid E. Magdo, Hopewell, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Mar. 23, 1973, Ser. No. 344,455
Int. Cl. B44d *1/18*; H01l *11/00*
U.S. Cl. 148—1.5 10 Claims



1. A method of forming Schottky-Barrier contacts to a silicon surface comprising
depositing a layer consisting essentially of platinum on said surface,
heating to form a platinum silicide layer on a silicon substrate having a maximum conductivity-determining impurity C_0 of 10^{18} atoms/cm^3,
depositing a metallic layer consisting essentially of aluminum on said platinum silicide layer, and
sintering the substrate at a temperature in the order of from 400° to 550°C. for at least 1 hour.

3,900,345
THIN LOW TEMPERATURE EPI REGIONS BY CONVERSION OF AN AMORPHOUS LAYER

Israel A. Lesk, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

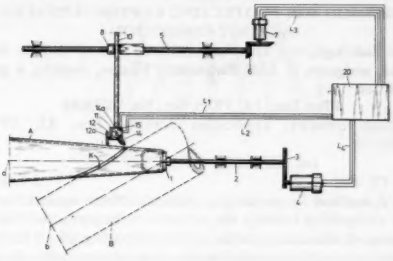
Filed Aug. 2, 1973, Ser. No. 385,195
Int. Cl.[2] H01L *7/00*
U.S. Cl. 148—1.5 3 Claims

1. A method for forming a thin layer of monocrystalline silicon atop a supporting monocrystalline silicon substrate comprising the steps of:
providing a monocrystalline silicon substrate, said substrate having a thin oxide layer on its upper surface;
depositing a polycrystalline silicon amorphous layer atop the thin oxide layer on said monocrystalline silicon substrate at a temperature lying within the range of 500°C to 600°C, thereby forming an interface including the thin oxide layer between said monocrystalline substrate and said polycrystalline silicon layer;
implanting ions through said polycrystalline silicon layer into said substrate to a sufficient extent to damage the interface including the thin oxide layer between said substrate and said polycrystalline silicon layer, thereby establishing intimate contact between said substrate and polycrystalline silicon layer; and
raising the temperature of said substrate and polycrystalline silicon layer to a range of 600°C to 900°C for converting said polycrystalline silicon amorphous layer to a monocrystalline silicon layer.

3,900,346
METHOD FOR THE AUTOMATIC GUIDANCE OF A WORK TOOL ON THE CURVES OF INTERSECTION OF TWO PIPES OR TUBES

Willi Muller, Ophovenerstr. 14-20, 567 Opladen, and Hans Noll, Am Werth 16, 4019 Hitdorf, both of Germany

Filed Sept. 10, 1973, Ser. No. 395,638
Claims priority, application Germany, Nov. 4, 1972, 2254147
Int. Cl. B23k *7/04*, *7/10*
U.S. Cl. 148—9.6 4 Claims



1. A method for automatically guiding a cutting tool on the curve of intersection of two pipes, one of which has a non-cylindrical cross section and in which the axes of the pipes are at an acute cutting angle to each other, comprising the steps of: effecting relative rotation between one of the pipes and the cutting tool about the axis of the pipe, and moving the cutting tool along the pipe axis with a speed of v parallel to the pipe axis in accordance with the following equation:

$$v = \frac{R}{\sin\alpha} + \frac{r}{\operatorname{tg}\alpha} - \cos\gamma \frac{R}{\sin\alpha} - \cos\phi \frac{r}{\operatorname{tg}\alpha}$$

in which
R = the radius of the latter-mentioned pipe;
r = the radius of the other pipe;
α = the sharp angle under which the axes of the two pipes intersect;
ϕ = the angle by which the pipe R is rotated;

$$\sin\gamma = \frac{\sin\alpha \dfrac{r}{\sin\alpha}}{\dfrac{R}{\sin\alpha}}$$

3,900,347
COLD-DRAWN, STRAIGHTENED AND STRESS RELIEVED STEEL WIRE FOR PRESTRESSED CONCRETE AND METHOD FOR PRODUCTION THEREOF

James J. Lorenzetti, Franklin, and James N. Cordea, Monroe, both of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed Aug. 27, 1974, Ser. No. 500,932
Int. Cl. C21d *9/52*
U.S. Cl. 148—12 B 7 Claims

4. A method of producing cold-drawn steel wire for prestressed concrete having reduced load loss due to stress relaxation and good ductility, comprising the steps of providing a silicon killed, hot reduced rod stock consisting essentially of, by weight percent, from about 0.70 to about 0.90 percent carbon, about 0.5 to about 1.0 percent manganese, about 0.025 percent maximum phosphorus, about 0.035 maximum sulfur, about 0.15 to about 0.35 percent silicon, about 0.010 to about 0.020 percent total nitrogen, about 0.010 to about

0.030 percent columbium, and remainder iron except for incidental impurities, austenitizing said stock by heating in the range of about 980° to about 1030°C, transforming said stock to a fully pearlitic microstructure by isothermal heating to about 540° to about 590°C, and air cooling, whereby to obtain a pearlite colony size ranging between about 15 and 30μ, and cold-drawing, straightening and stress relieving said rod stock into wire of desired final diameter.

3,900,348

METHOD FOR PROTECTING COPPER SURFACES AGAINST CORROSION

Hans Zukriegel, and Eike Karl Schrom, both of Vienna, Austria, assignors to Karl Entzmann, Vienna, Austria, a part interest

Filed Dec. 11, 1973, Ser. No. 423,684

Claims priority, application Austria, Dec. 13, 1972, 10601/72

Int. Cl.[2] C23C *1/10;* **C23F** *7/26*

U.S. Cl. 148—6.24 **3 Claims**

1. A method for protecting copper surfaces against corrosion, comprising treating the surfaces to be protected with a solution of elementary sulfur in the proportion of 15 to 20% by weight in a hydroxyalkyl amine, said solution being diluted with H_2O in the ratio of 1:100 to 1:1000 before application.

3,900,349

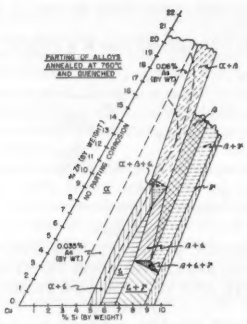
SILICON BRASS RESISTANT TO PARTING CORROSION

Louis P. Costas, Cheshire, Conn., assignor to The Anaconda Company, New York, N.Y.

Continuation-in-part of Ser. No. 434,613, Jan. 18, 1974, abandoned, which is a continuation of Ser. No. 222,508, Feb. 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 887,927, Dec. 24, 1969, abandoned. This application Mar. 19, 1974, Ser. No. 452,618

Int. Cl. C22c *9/10;* **C22f** *1/08*

U.S. Cl. 148—32 **2 Claims**



1. A silicon brass alloy resistant to parting corrosion consisting essentially of about 3–21 percent by weight zinc, an amount of silicon in the range of about 2.5 to about 7 percent, said amounts of zinc and silicon being sufficient to produce a structure consisting of alpha plus zeta phases in the brass, from about 0.030 percent up to the percentage by weight of solid solubility of one or more elements of the group consisting of arsenic, antimony and phosphorus remainder essentially copper, said alloy having been rapidly cooled to room temperature from a temperature in the range of 500°c to 760°C and consisting of alpha plus zeta micro structure.

3,900,350

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES IN WHICH SILICON OXIDE REGIONS INSET IN SILICON ARE FORMED BY A MASKING OXIDATION, WHEREIN AN INTERMEDIATE LAYER OF POLYCRYSTALLINE SILICON IS PROVIDED BETWEEN THE SUBSTRATE AND THE OXIDATION MASK

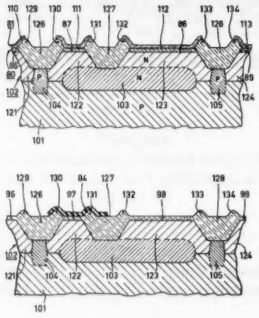
Johannes Arnoldus Appels, and Wilhelmus Henricus Cornelis Gerardus Verkuijlen, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 4, 1973, Ser. No. 347,806

Claims priority, application Netherlands, Apr. 8, 1972, 7204741

Int. Cl.[2] H01L *21/76, 27/04, 21/20*

U.S. Cl. 148—175 **11 Claims**



1. A method of manufacturing a semiconductor device comprising providing a semiconductor body comprised mainly of a monocrystalline silicon portion, providing on the surface of the semiconductor body a layer of polycrystalline silicon material, providing on the polycrystaline silicon layer a layer of material capable of masking silicon against oxidation, patterning at least the oxidation masking layer to form openings at the areas where it is desired to inset an oxide, and thereafter oxidizing said body at the said openings until an inset oxide is formed that penetrates down into the monocrystalline silicon portion to a depth substantially below that of adjacent polycrystalline silicon layer portions.

3,900,351

METHOD OF PRODUCING SEMICONDUCTOR INTEGRATED CIRCUITS WITH IMPROVED ISOLATION STRUCTURE

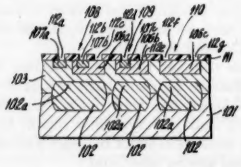
Masashi Mukogawa, and Takashi Takagaki, both of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Nov. 21, 1973, Ser. No. 417,783

Claims priority, application Japan, Nov. 24, 1972, 47-118175

Int. Cl.[2] H01L *21/22*

U.S. Cl. 148—186 **4 Claims**



1. A method of producing a semiconductor integrated circuit comprising the steps of forming highly doped regions

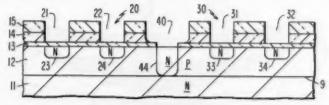
separated from each other on the surface of a semiconductor substrate, depositing a semiconductor layer on said surface, forming circuit elements in said semiconductor layer above each of said highly doped regions and thereafter diffusing a selected impurity through said semiconductor substrate from the entire back surface thereof and into regions of said semiconductor layer between said circuit elements by using the masking action of said highly doped regions, thereby forming high-resistivity regions between said circuit elements in said semiconductor layer, said high-resistivity regions being sufficiently high to effect electrical isolation between said circuit elements, wherein said impurity has a high diffusion coefficient in said semiconductor substrate and promotes conductivity of a type opposite to that of said semiconductor layer.

3,900,352

ISOLATED FIXED AND VARIABLE THRESHOLD FIELD EFFECT TRANSISTOR FABRICATION TECHNIQUE

Michael David Potter, Grand Isle, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 1, 1973, Ser. No. 411,857
Int. Cl.² H01L *21/223*
U.S. Cl. 148—187 **10 Claims**



1. A method of fabricating a variable threshold field effect transistor having source drain and gate regions and a fixed threshold field effect transistor having source, drain, and gate regions in the same semiconductor body with an isolation region between the devices comprising the steps of

depositing on the semiconductor body a series of insulating layers, adjacent layers having different etch ratios,

depositing a first mask on said layers which defines the source, drain, and gate regions of both a fixed threshold field effect transistor and a variable threshold field effect transistor,

selectively etching selected ones of said layers through said mask to delineate the source, drain, and gate regions of the transistors defined by said mask in said selected layers to selectively expose surface portions of the body,

selectively introducing impurities into the exposed surface portions of the body to create separated diffusions in the body,

masking the gate region of the variable threshold transistor, selectively removing the insulating layers in the gate region of the fixed threshold transistor,

growing a gate oxide in the gate region of the fixed threshold transistor, and

forming electrodes on said diffusions and over the gate regions of said fixed threshold and variable threshold transistors.

3,900,353

HIGH STRENGTH ALUMINUM INTERCONNECTIONS FOR MICROELECTRONICS PACKAGING

Carroll L. Marriott; Hans E. Patzer, both of Ellicott City; Ronald D. Hall, Baltimore, all of Md.; Charles D. Caposell, Alexandria, Va., and Aaron David Klein, Olney, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 16, 1974, Ser. No. 470,695
Int. Cl.² C23F *1/02*
U.S. Cl. 156—3 **5 Claims**

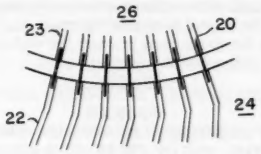
1. A method for making a supported-beam interconnecting segment comprising the steps of:

coating a section of film carrier material on both top and bottom surfaces with a film of electrically conductive material;

forming an image of the desired carrier-strip shape on the top film and the desired beams on the bottom film;

etching away on the top surface all of the conductive film except that covering the carrier strip;

etching away on the bottom surface all of the conductive material except that comprising the desired beams;



etching away all film carrier material except that comprising the carrier strip;

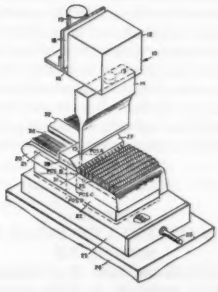
after bonding the beams to other electrical elements so as to form interconnections between said elements, etching away the remaining conductive film on the top surface of the carrier strip and then etching away the carrier strip material itself, leaving only the bonded beams and their associated electrical elements.

3,900,354

METHOD FOR BONDING PILE YARNS ONTO RIGID THERMOPLASTICS

Charles W. Carpenter, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 888,708, Dec. 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 780,038, Nov. 29, 1968, Pat. No. 3,640,786, which is a continuation-in-part of Ser. No. 731,221, May 22, 1968, abandoned. This application July 26, 1972, Ser. No. 275,385The portion of the term of this patent subsequent to Feb. 8, 1989, has been disclaimed.
Int. Cl. B32b *31/16*
U.S. Cl. 156—73.2 **6 Claims**



1. In a method of covering the surface of an article with tufted yarn wherein the article is advanced in an endwise direction, a plurality of yarns are guided onto the surface of the article, loops are formed in the yarns upstanding from the surface of the article with a portion of each loop engaging the surface along a bonding line extending transversely of the path of advancement of said article; the improvement of which comprises:

providing a substantially rigid article of a thermoplastic material;

providing yarns of an oriented thermoplastic material;

engaging the yarns and thermoplastic article under pressure along a bonding line between a support and the working surface of a sonic device;

focusing the sonic device precisely along the bonding line to avoid loss in orientation level of the yarns between the bonding lines;

sonically fusion bonding the yarns to the thermoplastic article;

releasing the thermoplastic article and yarns from between said support and said sonic device;

advancing the thermoplastic article a distance corresponding to the desired loop spacing; and

repeating the above steps to cover the surface of said rigid article with tufted thermoplastic yarn.

3,900,355

METHOD OF INTERNALLY WINDING REINFORCING MATERIAL AND OF PRODUCING REINFORCED SYNTHETIC PIPE

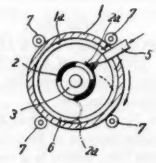
Toshiho Goto, Osaka, and Yoshinori Nishino, Sen-nan, both of Japan, assignors to Hitachi Shipbuilding and Engineering Co. Ltd., Osaka, Japan

Filed Mar. 14, 1973, Ser. No. 341,119

Claims priority, application Japan, Apr. 15, 1972, 47-37984; Apr. 15, 1972, 47-37992; Apr. 15, 1972, 47-37993

Int. Cl. B32b *31/16*

U.S. Cl. 156—74 **13 Claims**



1. The method of applying a reinforcing material to an internal cylindrical surface which includes:

winding the reinforcing material on a shaft;

placing the shaft concentrically within a cylinder having said internal cylindrical surface thereon and rotatable on the axis thereof, the shaft having a diameter less than that of the cylindrical surface thereby providing an annular space between the shaft and the cylindrical surface; and,

rewinding the reinforcing material from the shaft onto the internal cylindrical surface by rotating at least the cylinder to produce a rotational speed difference between the cylinder and the shaft such as to unwind the reinforcing material from the shaft, the reinforcing material reversing direction within said annular space during the rewinding step.

3,900,356

METHOD FOR MAKING A CELLULAR CUSHIONING STRUCTURE

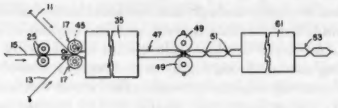
Walter T. Koch, Havertown, Pa.; Eugene G. Horsky, Claymont, Del., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 28, 1973, Ser. No. 345,768

Int. Cl. B32b *31/06*

U.S. Cl. 156—145 **8 Claims**

1. A method of making a cellular structure including the steps of sealing like plies of uniaxially oriented thermoplastic polymeric films in planar relationship to the opposite sides of an intermediate flexible ply along continuous areas which are spaced from each other and extend at substantially right angles to the direction of film orientation with the areas at which the respective film plies are sealed to the intermediate ply being in alternating relationship with each other, heating the overlapping plies to at least partially relax the orientation in the films, and delivering and containing between the intermediate ply and each of the film plies a fluid which is under a pressure greater than that of the ambient atmosphere whereby the intermediate ply is urged into a corrugated configuration.



3,900,357

COMPOSITE MATERIAL SPRINGS AND MANUFACTURE

Paul V. Huchette, and Homer H. Hall, Jr., both of Latrobe, Pa., assignors to Edgewater Corporation, Latrobe, Pa.

Continuation-in-part of Ser. No. 34,117, May 4, 1970, abandoned. This application Nov. 30, 1972, Ser. No. 310,815

Int. Cl.² B65H *81/00;* **B32B** *31/00;* **B28B** *11/12*

U.S. Cl. 156—185 **10 Claims**

1. Method for forming a fiber-reinforced composite spring having a tension side and a compression side, a neutral axis extending longitudinally between its longitudinal ends, and a varying cross-sectional area measured in a plane perpendicular to the neutral axis with the cross-sectional area diminishing in approaching at least one of the longitudinal ends of the spring providing a tapered configuration, comprising the steps of

providing a plurality of varying-length plies comprising solely non-woven fibers in side-by-side, longitudinally oriented, unidirectional relationship, such fibers being held in a curable matrix material,

providing a plurality of elongated full-length plies comprising solely non-woven fibers in side-by-side, longitudinally oriented, unidirectional relationship with the fibers being held in a curable matrix material, such elongated plies extending at least over the full longitudinal length of the composite spring being formed,

providing a molding means having a configuration conforming to the desired tapered configuration of the elongated spring being formed,

assembling such varying length plies and such elongated full-length plies to form a composite spring,

with shorter length plies of the varying length plies being centrally located contiguous to the neutral axis and plies of progressively increasing length of such varying length plies being located outwardly from such neutral axis in the direction of both the tension and compression sides of the composite spring being formed and including

placing an elongated ply comprising solely nonwoven fibers in side-by-side longitudinally oriented, unidirectional relationship along the neutral axis to extend between longitudinal ends of the spring being formed,

with such plurality of elongated full length plies overlying such varying length plies, and

treating such assemblage of plies to cure such matrix material to form a solid unitary structure in which the nonwoven fibers of such assemblage of plies are bonded together by the cured matrix material.

3,900,358
PROCESS FOR MAKING A FUEL ELEMENT FOR HIGH TEMPERATURE NUCLEAR REACTORS

Roke Bujas, and Claude Ringot, both of Gif-sur-Yvette, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 213,283, Dec. 29, 1971, abandoned. This application Mar. 8, 1973, Ser. No. 339,292
Claims priority, application France, Jan. 8, 1971, 71.00543; Dec. 7, 1971, 71.43837
Int. Cl. B29c *17/02*
U.S. Cl. 156—215 2 Claims

1. A process for making a fuel element for high temperature nuclear reactors comprising the steps of forming a central fuel compact of successive annular segments, impregnating at least one carbon fabric with a mixture of graphite powder and thermosetting resin, jacketing said compact internally and externally with said impregnated fabric and bonding said fabric to said compact by polymerization and curing of the thermosetting resin and degassing the fuel element.

2. A process for making a fuel element for high temperature nuclear reactors comprising the steps of forming a central fuel compact of successive annular segments containing a mixture of graphite powder and thermosetting resin, jacketing said compact internally and externally with at least one sheet of carbon fabric and bonding said fabric to said compact by polymerization and curing of the thermosetting resin and then degassing the fuel element.

3,900,359
METHOD AND APPARATUS FOR TELEVISION TUBE SHADOW MASK

Joseph J. Bukewell, Boxford, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed Feb. 26, 1973, Ser. No. 335,503
Int. Cl. B44d *1/18*; H01j *29/46*
U.S. Cl. 156—242 22 Claims

1. A method of fabricating a picture tube shadow mask in a predetermined curvature employing a mandrel having said predetermined curvature to a curved surface thereof and further having a plurality of columns extending outward from regions of said curved surface arranged in a preset pattern, said method comprising the steps of:

forming a curved layer of a material onto said surface to a predetermined thickness surrounding said columns;

said columns substantially defining holes through said layer; and

separating said layer from said surface to provide said shadow mask.

14. A method of fabricating a multiplicity of picture tube shadow masks having substantially identical predetermined curvature and aperture placement employing a mandrel having said predetermined curvature to a curved surface thereof and further having a plurality of areas thereon arranged in a preset pattern, said method comprising the steps of:

forming a plurality of columns to extend outward from regions of said curved surface coextensive with said plurality of areas;

forming a first layer of a material onto said surface to a predetermined thickness surrounding said columns;

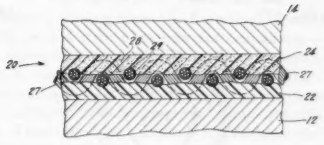
separating said layer from said surface to provide a single shadow mask; and

repeating the first and second mentioned forming steps and said removing step to provide an identical one of said shadow masks on each repetition.

3,900,360
SELF-HEATING COMPOSITE BONDING MEANS AND METHOD

Alfred F. Leatherman, Columbus, Ohio, assignor to William C. Heller, Jr., Milwaukee, Wis.

Filed Oct. 20, 1972, Ser. No. 299,349
Int. Cl. B29c *27/04*
U.S. Cl. 156—272 8 Claims



1. A process for thermal fusion bonding first and second thermally bondable plastic bodies formed of materials exhibiting mutual bonding incompatibility, said method comprising the steps of:

providing a composite bonding agent including first and second thermoplastic layer means having bonding compatibility with the first and second bodies, respectively, and bonding incompatibility with each other, said layer means being at least partially embedded in a medial fibrous stratum of strands for joinder thereto, at least one of said layer means having dispersed therein a particulate susceptor heatable upon exposure to a selected form of indirectly applied energy;

juxtapositioning the first and second bodies so that the portions thereof to be bonded are contiguous;

applying the bonding agent to the bodies with the first and second thermoplastic layer means adjacent the bodies with which they have bonding compatibility;

exposing the composite bonding agent to a selected form of indirectly applied energy to heat said first and second thermoplastic layer means and the adjacent portions of the bodies to heat sealing temperatures; and

bringing said first and second bodies into abutment with said composite bonding agent to form thermal fusion bonds with the first and second thermoplastic layer means, respectively.

3,900,361
HOT FUSION COATING MASSES

Gerhard Hoppe, Marl-Sinsen; Heinrich Leppek, Gelsenkirchen-Buer; Leo Rensmann, and Helmut Kehr, both of Dorsten, all of Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Division of Ser. No. 194,023, Oct. 29, 1971, abandoned. This application July 2, 1973, Ser. No. 376,044
Claims priority, application Germany, Oct. 30, 1970, 2053365
Int. Cl. C09j *5/00*; B32b *27/32*
U.S. Cl. 156—334 7 Claims

1. In a process for adhering two substances together wherein to one substance there is applied an adhesive at an elevated temperature which when it cools adheres thereto and

the substance containing said adhesive is applied to a second substance which abuts the adhesive on the first substance and is heat fused thereto, improvement wherein said adhesive is a fusion coating mass consisting essentially of an atactic homo or co-polymer of butene-1 said fusion coating mass containing at least 60% by weight solids.

2. A process according to claim **1** wherein the fusion coating mass contains a salt of manganese, a salt of aluminum, a salt of sodium, a salt of potassium, a salt of iron, an oxide of manganese, an oxide of aluminum, an oxide of sodium, an oxide of potassium, an oxide of iron, up to 30% by weight polyisobutylene, barium sulfate, crystalline chalk, amorphous chalk, heavy spar, talc, asbestos, clay, low molecular weight polyolefin having a wax-like consistency or paraffin.

3,900,362

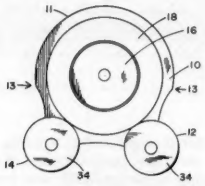
TAPING MACHINE

Edward W. Schaffer, 1690 Walnut Ave., Winterpark, Fla. 32789

Continuation of Ser. No. 332,066, Feb. 13, 1973, abandoned. This application Nov. 18, 1974, Ser. No. 524,513

Int. Cl.[2] **B44C** *7/04*; **C09J** *7/02*

U.S. Cl. 156—577 **10 Claims**



1. A taping machine for applying masking material for painting comprising in combination:

a support means:

first and second resilient rollers mounted on said support means about generally parallel rotational axes:

a rotatable hub mounted on said support means and adapted to carry a roll of tape in position to feed tape onto said first and second resilient rollers.

3,900,363

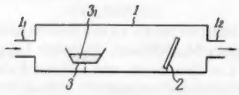
METHOD OF MAKING CRYSTAL

Kohta Teraoka, and Toshio Nakano, both of Kawasaki, Japan, assignors to Nippon Columbia Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1972, Ser. No. 306,891

Int. Cl. C23c *13/00*

U.S. Cl. 156—612 **1 Claim**



1. A method of growing a crystal comprising steps in the following sequence:

a. disposing a substrate of gallium arsenide inside one end of an open tube;

b. disposing indium in said open tube near the second end and heating it to about 900° C;

c. passing a first gas over said indium and said substrate comprising a mixture of argon and gaseous phosphorous trichloride into said tube from the second end and at a flow rate of about 20 cm^3 per minute to gas etch the surface of said substrate while the substrate is at a temperature of about 450°–500° C; and

d. passing a second gas over said indium and said substrate comprising a mixture of hydrogen and gaseous phosphorous trichloride into said tube from the second end at a flow rate of about 20 cm^3 per minute to grow a crystal of indium phosphide on said substrate while the substrate is at a temperature of about 550°–650° C.

3,900,364

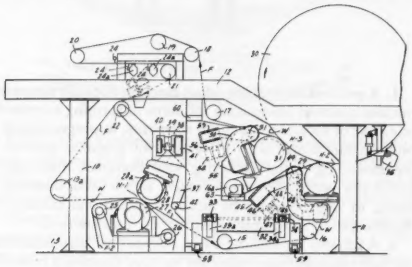
ROLL-OUT MODULE FOR A PAPERMAKING PRESS SECTION

John P. Nelson, Beloit, Wis.; Robert E. Page, Davis, Ill., and Paul S. Hendrickson, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Continuation-in-part of Ser. No. 250,961, May 8, 1972, abandoned. This application Feb. 28, 1974, Ser. No. 446,591

Int. Cl. D21f *3/00*, *3/06*

U.S. Cl. 162—274 **6 Claims**



1. In a press section of a paper making machine, the combination comprising:

a press frame having a front frame section and a rear frame section;

a plurality of first press rolls and a plurality of second press rolls forming nips therebetween,

said second rolls supported between said frame sections, said first and second rolls located between said frame sections in operating position;

a looped felt passing through said press nips;

felt rolls positioned for supporting said looped felt with said second rolls on said frame sections;

a roll-out module supporting said first press rolls;

mobile means supporting said module for axial movement of the first rolls from an operating first position betweeen the frame sections and a servicing second position with the first rolls on said module in an aisle in front of the paper machine outwardly of said frame sections,

said second press rolls remaining stationary when said module is moved;

guide rolls;

said guide rolls and said second rolls positioned so that said felt is fully supported thereon so that said first rolls can be movable axially into servicing position relative to the felt while the felt is strung on said second rolls.

6. A press arrangement for a paper machine comprising:

a press couple including a pair of press rolls forming a press nip therebetween;

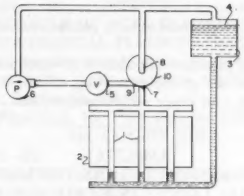
a first support for one of the rolls;
a second support for the other of said rolls including a pair of swing arms carrying the roll ends;
a movable cross-machine beam extending parallel to the rolls carried by the swing arms and connected at its ends to the swing arms;
a stationary beam coextensive with the movable beam; and
a plurality of pressure members positioned between the beams at axially spaced intervals along said beams for applying a force to the movable beam thereby applying a force to the arms for controlling nip pressure.

3,900,365

FLUID SHUT-DOWN SYSTEM FOR A NUCLEAR REACTOR

Francis W. Barclay; J. Richard Frey, both of Pinawa; James N. Wilson, and Robert W. Besant, both of Saskatoon, all of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Oct. 5, 1973, Ser. No. 403,794
Claims priority, application Canada, Oct. 10, 1972, 153528
Int. Cl. G21c *7/22*
U.S. Cl. 176—22 **12 Claims**



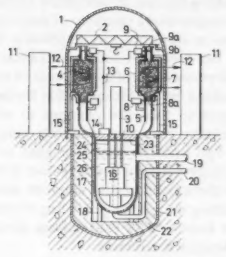
1. A shut-down system for a nuclear reactor comprising:
a. at least one upwardly extending poison tube passing through the reactor core, said tube having an upper and lower end;
b. a reservoir for liquid poison communicating with the lower end of said tube;
c. means for applying pressure to the liquid in the reservoir biasing the liquid for flow into the reactor core through said poison tube;
d. a fluidic vortex valve having a supply port, outlet port and control port, said supply port communicating with the upper end of said tube;
e. gas supply means for supplying a substantially continuous flow to the control port of the vortex valve which results in high impedance to flow from the supply port to the outlet port;
f. means for applying gas pressure to the poison tube for preventing the poison from entering the reactor core when the vortex valve is in the high impedance state;
g. means for modulating the flow of gas to said control port in response to deviations of the liquid poison level in said tubes from a predetermined level, in order to maintain the poison at the predetermined level; and
h. control means for interrupting the flow to the control port whereby the vortex valve is switched to a low impedance state allowing release of gas pressure from the poison tube such that the liquid poison enters the core effecting reactor shut-down.

3,900,366

EMERGENCY COOLING APPARATUS FOR REACTORS

Seiichiro Sakaguchi, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 2, 1974, Ser. No. 457,365
Claims priority, application Japan, Apr. 2, 1973, 48-36727
Int. Cl. G21c *9/00*
U.S. Cl. 176—37 **11 Claims**



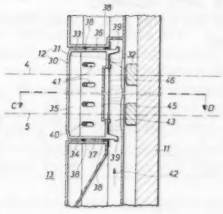
1. Emergency cooling apparatus for nuclear reactors having a normally sealed core container for containing a nuclear core, a coolant of liquid metal around the core within the core container, a cover gas above the liquid coolant within the core container, and a second auxiliary apparatus container above the core container, which comprises: means for detecting at least one of the cover gas and the liquid metal coolant leaked into the second container to produce an emergency signal, means for containing a heat exchange material that is inert to the liquid metal coolant; means for cooling the heat exchange material during the operation of the nuclear reactor; means for dispensing the heat exchange material to the lower portion of said second container where the liquid metal coolant would collect upon leakage to contact with the leaked coolant; and valve means normally preventing dispensing of the heat exchange material and releasing the heat exchange material to said dispensing means only in response to said emergency signal in accordance with the detection of the leaked coolant or cover gas by the means for detecting.

3,900,367

RESTRAINT SYSTEM FOR CORE ELEMENTS OF A REACTOR CORE

Gottfried Class, Blankenlock, Germany, assignor to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Dec. 6, 1972, Ser. No. 312,577
Claims priority, application Germany, Dec. 15, 1971, 2162171
Int. Cl. G21c *19/12*
U.S. Cl. 176—87 **8 Claims**



1. In a restraint system for elongated prismatic core elements having longitudinal axes and arranged in a close, side-by-side, parallel relationship forming a core element bundle, the restraint system being of the type that includes restraint elements arranged circumferentially about the core element bundle and exerting thereto a radially inwardly directed re-

straining force generating friction forces between the core elements along at least one plane of restraint extending through the core element bundle transversely to said axes at least at one point along its length, the improvement comprising rolling elements arranged between adjoining core elements in the zone of said plane, said adjoining core elements being in contact with their respective rolling elements in said plane, whereby said core elements being in engagement with one another by rolling friction in said plane in response to said force; means for supporting a plurality of said rolling elements in each core element along the circumference thereof; a plurality of resilient bar members secured to each core element along the circumference thereof in the zone of said plane, said resilient bar members being arranged for flexing radially inwardly with respect to the core element to which they are secured, any adjoining two core elements being so oriented with respect to one another that any said rolling element supported in one core element engages one of said bar members supported in the adjoining core element, said resilient bar members constituting means for providing a resilient engagement between at least one of said rolling elements and the adjoining core element it contacts.

3,900,368

FERMENTATIVE PRODUCTION OF RIBOFLAVINE

Hitoshi Enei, Zushi; Katsuaki Sato; Yasuo Anzai, both of Kawasaki, and Hiroshi Okada, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Oct. 15, 1973, Ser. No. 406,319

Claims priority, application Japan, Oct. 26, 1972, 47-107504

Int. Cl. C12d *5/04*

U.S. Cl. 195—96 **5 Claims**

1. A method of producing riboflavine which comprises culturing a riboflavine-producing, artificially induced mutant of a parent microorganism of the genus *Bacillus* on an aqueous fermentation medium including assimilable sources of carbon and nitrogen, inorganic ions, and minor organic nutrients required for the growth of said mutant until riboflavine accumulates in said medium; and recovering the accumulated riboflavine from said medium, said parent microorganism being unable to produce riboflavine when cultured on said medium.

3,900,369

COAL CHARGING COVER AND SEAL FOR THE COAL CHARGING HOLE OF A COKE OVEN

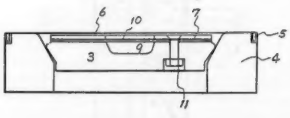
Sadanao Irie, Izumisano; Kenichi Tomomoto, Kaizuka; Toyohiko Akahori, and Kazuhisa Simomura, both of Bizen, all of Japan, assignors to Osaka Gas Company, Ltd., Osaka and Kyushu Refractories Co., Ltd., Bizen, both of Japan

Filed Dec. 10, 1973, Ser. No. 423,147

Claims priority, application Japan, Dec. 9, 1972, 47-141672; June 12, 1973, 48-69992

Int. Cl. C10b *1/06, 25/06, 29/00*

U.S. Cl. 202—247 **23 Claims**



1. A coke oven charging-hole closure construction comprising a coke oven cover and a coal charging seat adapted to receive said coke oven cover in a tight relationship, thereby establishing a complete seal between the coke oven cover and the coal charging seat, at leat the contacting surfaces between said coke oven cover and said coal charging seat being made of a refractory body.

3,900,370.

PROCESS FOR TREATING ALUMINUM SURFACES

Hans Gunther Germscheid, Hosel; Wolfgang Friedemann, Neuss, and Roland Geisler, Dusseldorf-Holthausen, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

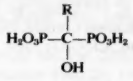
Filed Feb. 23, 1973, Ser. No. 335,065

Claims priority, application Germany, Mar. 10, 1972, 2211553

Int. Cl. C23c *1/08;* **B41m** *1/18;* **B44c** *3/02*

U.S. Cl. 204—38 A **5 Claims**

1. In the process for treating the surface of aluminum or an aluminum alloy which comprises subjecting said surface to an anodic oxidation and subsequently sealing with hot water or steam, the improvement which consists essentially of sealing said surface by applying an aqueous solution consisting essentially of water, calcium ions and from 0.001 to 0.05 gm per liter of at least one acid selected from the group consisting of (A) a water-soluble phosphonic acid which forms a complex with a divalent metal, said acid having the formula



in which R is selected from the group consisting of phenyl and alkyl of 1 to 5 carbon atoms, (B) a water-soluble salt of said acid of (A), and (C) the mixtures thereof at a temperature ranging from 90°C to the solution boiling point temperature and at a pH of from 5 to 6.5, to the anodic oxidized surface, the molar ratio of calcium ions to phosphonic acid being at least 2:1.

3. The process as claimed in claim **1** in which said salt of (B) is selected from the group consisting of alkali metal salts, ammonium salts, and lower alkanolamine salts.

3,900,371

METHOD OF CONTROLLING THE THICKNESS OF THE LATERAL LEDGES IN A CELL FOR THE ELECTROLYTIC RECOVERY OF ALUMINUM

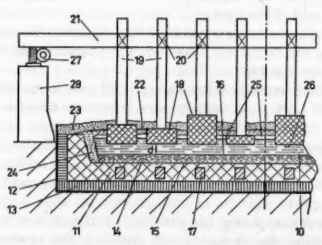
Kiranendu B. Chaudhuri, Gampel, Switzerland, assignor to Swiss Aluminum Ltd., Chippis, Switzerland

Filed Feb. 15, 1974, Ser. No. 443,099

Claims priority, application Switzerland, Jan. 30, 1974, 1243/74

Int. Cl.[2] C25C *3/06*

U.S. Cl. 204—67 **8 Claims**



1. A method for controlling the thickness of the lateral ledges of frozen electrolyte in a cell for the recovery of aluminum metal by the electrolysis of aluminum oxide dissolved in an electrolyte including a fluoride melt, said electrolysis being conducted with at least one anode connected to and movable with an anode beam operative for raising and lowering said anode with respect to said electrolyte, said method comprising the steps of:

a. measuring the instantaneous ohmic resistance of said cell at predetermined regular intervals of time during which measurements there are no anode effects which can substantially affect the measured instantaneous ohmic resistance and during which measurements there are no working operations carried out or have been previously carried out which can substantially affect the measured instantaneous ohmic resistance, measuring the average instantaneous ohmic cell resistance from a plurality of the measured instantaneous ohmic cell resistances obtained during a predetermined period of time, measuring the base resistance of the cell, obtaining the difference ΔR between the average instantaneous ohmic cell resistance and the base resistance;

b. moving said anode beam to minimize the difference between the measured instantaneous ohmic cell resistance and the base resistance when the difference ΔR exceeds a predetermined amplitude;

c. measuring the level of the anode beam;

d. thereafter repeating the steps a) to c) after a time interval not exceeding about one day;

e. measuring the differences ΔB between the level of the anode beam obtained in the steps c) and d) and compensating for level differences due to the tapping of and the accumulation of the aluminum metal in the cell; and

f. changing the thickness of the lateral ledges to a predetermined amplitude whenever the difference ΔB lies outside a predetermined range of values.

3,900,372
RECYCLE OF ACYL FLUORIDE AND ELECTROCHEMICAL FLUORINATION OF ESTERS

William V. Childs; Benedict H. Ashe, Jr., and Paul S. Hudson, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 16, 1974, Ser. No. 505,996
Int. Cl. C07b *9/00*
U.S. Cl. 204—81 **18 Claims**

1. A process for producing perfluorinated acyl fluorides comprising in combination:

1. contacting a primary alkanol with an acyl fluoride under esterification conditions to produce a partially fluorinated ester;
2. passing said partially fluorinated ester to an electrochemical fluorination cell to produce a perfluorinated ester;
3. cleaving said perfluorinated ester to produce said perfluorinated acyl fluorides and acyl fluoride for recycle;
4. recycling a portion of said acyl fluoride from step (3) to step (1) to sustain said esterification; and
5. recovering a portion of said perfluorinated acyl fluoride as product.

3,900,373
METHOD OF REGULATING ANODE-CATHODE SPACING IN AN ELECTROLYTIC CELL

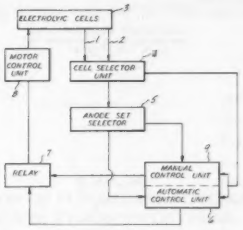
Richard W. Ralston, Jr., Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 272,240, July 17, 1972, abandoned. This application July 18, 1974, Ser. No. 489,647
Int. Cl. C01d *1/08, 1/14;* **B01k** *3/00*
U.S. Cl. 204—99 **22 Claims**

1. In a method for adjusting the space between electrodes in an electrolytic cell containing an electrolyte decomposable by electric current, said electrolyte being in contact with saic electrodes, said electrodes being comprised of at least one adjustable solid anode set and a liquid cathode in spaced relationship, and a voltage being applied to said cathode and said anode set to develop an electric current flow through said electrolyte to effect decomposition thereof, the improvement which comprises

a. operably connecting to said adjustable anode set a motor drive means adapted to raise and lower said adjustable anode set upon receipt of electric signals from a digital computer,

b. obtaining N current measurements of the current to said anode set over a predetermined period,



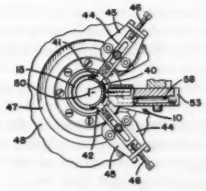
c. comparing each current measurement with the preceding current measurement and determining the difference in current, and,

d. conveying an electric signal from said computer to said motor drive means to increase said space when said difference in current is an increase which exceeds a predetermined limit.

3,900,374
METHOD OF ELECTROCHEMICAL MACHINING

William Andrew Haggerty, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Division of Ser. Nos. 719,450, April 8, 1968, Pat. No. 3,730,861, and Ser. No. 719,451, April 8, 1968, Pat. No. 3,591,473. This application Mar. 12, 1971, Ser. No. 123,773
Int. Cl. B23p *1/00, 1/09, 1/20*
U.S. Cl. 204—129.5 **2 Claims**



1. A method of electrochemically machining a surface of revolution on a rotating workpiece comprising the steps of

rotating said workpiece about its axis;

placing an electrochemical machining tool having an essentially flat machining surface adjacent said workpiece to form a gap therebetween, said machining surface having a straight edge in a plane which also includes the axis of said workpiece, said machining surface being oriented essentially perpendicular to said plane so that the smallest gap dimension exists between said edge and said workpiece;

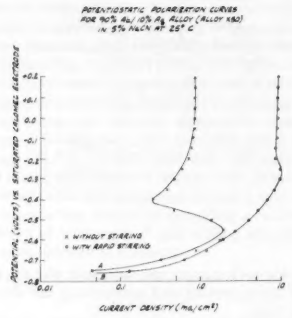
introducing electrolyte into said gap so that it flows across said machining surface and between the tool and the workpiece in a direction parallel to the direction of relative movement and toward said smallest gap dimension; and

connecting a source of electrical current between the workpiece and the tool such that the workpiece is anodic with respect to the tool to cause machining of said surface of revolution as it rotates past said machining surface.

3,900,375
ELECTROLYTIC SEPARATION OF METALS

Robert Baboian, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 13, 1973, Ser. No. 424,526
Int. Cl.[2] C25F *1/00, 5/00*
U.S. Cl. 204—140 **9 Claims**



1. A process for separating a first metal selected from the group consisting of gold, silver and alloys of gold and silver from a composite metal body in which said first metal is adhered as an external layer over a substrate constituted by a second metal, the process comprising the steps of:

immersing the body in an electrolytic solution of an alkali metal cyanide in which the two metals are subject to differential anodic dissolution at a predetermined anode voltage measured by reference to a standard electrode with the degree of dissolution of the second metal in the half-cell comprising said second metal and said solution being substantially less than the degree of dissolution of the first metal in the half-cell comprising said first metal and said solution at said voltage;

supplying direct current to said body from the positive terminal of a direct current power source whose negative terminal is connected to a second electrode immersed in said solution thereby establishing an electrolytic circuit in which said body is the anode and said second electrode is the cathode; and

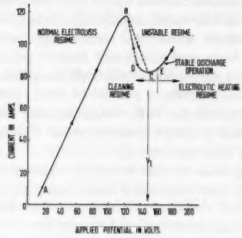
continuously controlling the voltage of said anode relative to said standard electrode at a level at which the degree of dissolution of the second metal in the half-cell comprising said second metal and the solution is substantially less than the degree of dissolution of the first metal in the half-cell comprising said first metal and the solution thereby causing selective removal of said first metal from said body.

3,900,376
CLEANING OF METAL SURFACES

Mervyn John Copsey, Chester, and Brian Hanson Wilby, Leeds, both of England, assignors to The Electricity Council, London, England

Filed Nov. 6, 1973, Ser. No. 413,415
Claims priority, application United Kingdom, Nov. 8, 1972, 51631/72
Int. Cl. C23b *3/02, 1/04, 1/06*
U.S. Cl. 204—141.5 **6 Claims**

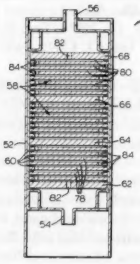
1. A method of cleaning a surface of an elongate metal article in a continuous process comprising the steps of moving the surface of the article through an electrolyte which does not react chemically with the metal to be cleaned or any surface contaminant on the article so that successive regions of the surface area to be cleaned are covered by the electrolyte and applying an electric voltage between the article and at least one other electrode electrically in contact with the electrolyte, said voltage being sufficiently high that a layer of gas or vapour covers the surface to be cleaned and a discharge occurs through this layer between the electrolyte and the surface, the electrolyte being static or caused to flow sufficiently slowly over said surface that, as the voltage is increased, there is an unstable regime where the current decreases with increase of voltage, the voltage being maintained above the level of this unstable regime.



3,900,377
REDUCTION OF TOXICITY OF AQUEOUS SOLUTIONS

Kurt Enns, 345 Dale Crescent; John J. Byerley, 154 Chelford Crescent, and Clare J. Beingessner, 505 Oxbow Rd., all of Waterloo, Ontario, Canada

Filed Jan. 8, 1973, Ser. No. 322,085
Int. Cl. C02c *5/12*
U.S. Cl. 204—149 **11 Claims**



1. A method of decreasing the concentration of anodically-oxidizable species selected from free and/or complexed cyanide ions, cyanate ions and thiocyanate ions in an aqueous solution thereof which comprises:

passing said aqueous solution along a plurality of fluidly-interconnected successive confined paths each constituted by at least one pair of electrodes having faces of opposite polarity spaced apart a distance of about 1/16 inch to 1 inch, said passage of said aqueous solution along said plurality of fluidly-interconnected successive confined paths providing a layer of liquor immediately adjacent each of said electrode faces and a bulk mass of liquor between said layers,

applying d.c. power between said electrodes to provide a current density of less than 200 amps per sq. ft. to said electrodes, whereby an electroactive anode and an electroactive cathode are provided,

maintaining said aqueous solution at a flow rate along said confined paths and over said electrodes less than 5 ft/sec, oxidizing said anodically-oxidizable species at said electroactive anode to produce materials including gaseous material,

intermixing the layer of liquor immediately adjacent said electroactive anode with said bulk mass of said aqueous

solution to minimize pH polarization and anodically-oxidizable species concentration polarization between said bulk mass and said liquor layer immediately adjacent said electroactive anode,

scrubbing bubbles of gaseous material from both said electroactive anode and said electroactive cathode during said passage of said aqueous solution along said plurality of fluidly-interconnected successive confined paths to form a mixture of said gaseous material and said aqueous solution and to minimize the accumulation of gaseous material on said electroactive anode and electroactive cathode,

conveying said mixture of gaseous material and aqueous solution successively along said confined paths, and

restricting the passage of said mixture along said confined paths below a total path length above which the proportion of gas in the mixture at the extremity of said paths exceeds about 20 percent.

3,900,378

HYDROGELS FROM RADIATION CROSSLINKED BLENDS OF HYDROPHILIC POLYMERS AND FILLERS

Steven N. Yen, Highland Mills, and Frederick D. Osterholtz, Warwick, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 194,511, Nov., 1971, abandoned. This application Nov. 6, 1972, Ser. No. 303,880

Int. Cl. B01J *1/10;* **C08f** *3/00, 3/34, 3/62, 13/00, 45/18, 45/24, 45/64, 45/68*

U.S. Cl. 204—159.14 **25 Claims**

1. A process for the preparation of a free-flowing, water swellable hydrophilic polymer in particulate form, said process comprising the steps of:

a. blending a mixture of at least one water soluble pulverulent hydrophilic polymer and at least one pulverulent inert filler in a ratio of polymer to filler of from about 1:9 to about 9:1, a substantial portion of said filler having a particle size less than that of said polymer and present in an amount sufficient to cover a substantial portion of the surface area of said pulverulent polymer,

b. thereafter while said blending is continued, contacting said mixture under thorough agitation with a finely divided spray of water at a rate and in an amount not to exceed that at which the mixture is maintained in a free-flowing particulate form, and

c. thereafter exposing said mixture in said free-flowing particulate form to ionizing radiation for a period of time to crosslink said polymer.

3,900,379

HYDROXYL-TERMINATED CHLOROPRENE POLYMERS

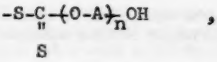
Tsuneichi Takeshita, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 2, 1974, Ser. No. 457,387

Int. Cl. C08f *1/18*

U.S. Cl. 204—159.24 **7 Claims**

1. A substantially linear polymer of chloroprene containing 0–50 weight percent of at least one copolymerizable monomer, said polymer being terminated substantially at each end of the chain by a xanthate group having the following formula



wherein A is an alkanediyl or cycloalkanediyl radical having at least two carbon atoms, and *n* is a positive integer of 1–4; with the proviso that the two valences of A are attached to different carbon atoms, only one of which can be a tertiary carbon atom.

3,900,380

PREPARATION OF FLUORINATED CYCLOBUTENYL ALKYL ETHER COPOLYMERS

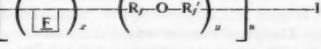
Richard W. Anderson, Englewood, Colo., and Hughie R. Frick, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 231,404, March 2, 1972, Pat. No. 3,840,603. This application Mar. 21, 1974, Ser. No. 453,652

Int. Cl. B01j *1/10*

U.S. Cl. 204—163 R **3 Claims**

1. A process for the preparation of a highly fluorinated polymer of the formula:



wherein R_f and R_f' are straight or branched chain perfluoroalkyl groups or perfluoroalkyl ethers having a combined number of carbon atoms totaling from 3 to 20, *n* is a number from 2 to 10,000 representing the degree of polymerization and the ratio of x:y ranges from 0.001:1 to 1000:1, which comprises reacting in the presence of mercury and ultraviolet light a diiodo perfluorocyclobutene of the formula

with an iodo terminated perfluoroalkyl ether of the formula I—R_f—O—R_f'—I wherein R_f and R_f' are straight or branched chain perfluoroalkyl groups or perfluoroalkyl ethers having a combined number of carbon atoms totaling from 3 to 20, said process being further defined in that the ratio of perfluorocyclobutene to iodo terminated perfluoroalkyl ether may range from 1000:1 to 1:1000.

3,900,381

METHOD OF FORMING BETA-ALUMINA ARTICLES

Robert W. Powers, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

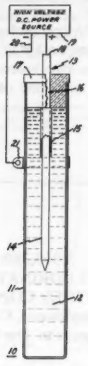
Filed Sept. 24, 1973, Ser. No. 400,047

Int. Cl. B01k *5/02;* **C23b** *13/00*

U.S. Cl. 204—181 **9 Claims**

1. A method of forming a beta-alumina article which comprises providing a suspension consisting of beta-alumina particles the majority of which have a diameter in the range of 1 to 2 microns in an organic fluid having a dielectric constant at 25°C of from 12 to 24, electrophoretically depositing the beta-alumina particles from the suspension as a dense deposit onto a charged electrode in a DC electric field of from 100 to 10,000 volts per centimeter, drying the deposit on the elec-

trode, removing the deposit from the electrode, and sintering the deposit in an oxygen oxidizing atmosphere at a temperature between 1,700° and 1,825°C resulting in a dense, sintered beta-alumina article.



3,900,382

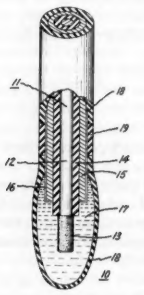
MINIATURE PROBE CONTAINING MULTIFUNCTIONAL ELECTROCHEMICAL ELECTRODES

John F. Brown, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 1, 1974, Ser. No. 519,796

Int. Cl. G01n *27/46*

U.S. Cl. 204—195 M **12 Claims**



1. A miniature probe containing a carbon dioxide sensor and a specific ion electrode which comprises a flexible metallic elongated electrode lead, an electrochemically active region responsive to carbon dioxide changes adhering tightly to and in electrical contact with one end portion of the electrode lead, electrical insulation surrounding the electrode lead, a second metal electrode lead surrounding at least partially and spaced from the first electrode lead by the electrical insulation thereon, the second electrode containing a second electrochemically active region of silver and silver halide thereon, an electrolyte contacting both electrochemically active regions, a first outer sheath of a carbon dioxide permeable diffusion barrier material encapsulating at least both electrochemically active regions and the electrolyte thereby forming a carbon dioxide sensor, outer electrical insulation surrounding at least partially the second electrode lead, and a second outer sheath of specific ion-permeable barrier material surrounding a portion of the second electrode lead and in contact with its silver and silver halide region thereby forming a specific ion electrode, the outer electrical insulation and first and second sheaths forming a continuous cover for the probe.

7. A miniature probe containing an oxygen sensor and a specific ion electrode which comprises a flexible metallic elongated electrode lead, an electrochemically active region responsive to oxygen changes adhering tightly to and in electrical contact with one end portion of the electrode lead, electrical insulation surrounding the electrode lead, a second metal electrode lead surrounding at least partially and spaced from the first electrode lead by the electrical insulation thereon, the second electrode containing a second electrochemically active region of silver and silver halide thereon, an electrolyte contacting both electrochemically active regions, a first outer sheath of an oxygen permeable diffusion barrier material encapsulating at least both electrochemically active regions and the electrolyte thereby forming an oxygen sensor, outer electrical insulation surrounding at least partially the second electrode lead, and a second outer sheath of specific ion-permeable barrier material surrounding a portion of the second electrode lead and in contact with its silver and silver halide region thereby forming a specific ion electrode, and the outer electrical insulation and first and second sheaths forming a continuous cover for the probe.

3,900,383

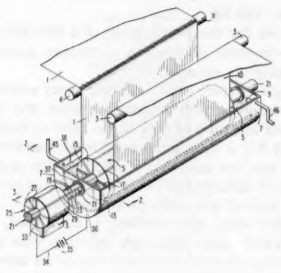
APPARATUS FOR ELECTROPLATING

Lowell W. Austin, Weirton, W. Va., and Walter Alexander Wilson, Pittsburgh, Pa., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed July 24, 1974, Ser. No. 491,377

Int. Cl. C23b *5/68, 5/58;* **B60l** *9/00*

U.S. Cl. 204—211 **14 Claims**



1. An electroplating apparatus comprising

a. bath container means including walls for holding an electrolyte,

b. an elongated shaft in the bath container means having one end portion extending through one wall of the bath container means,

c. an electroplating contact roll for passing conductive strip to be plated through the bath carried by the shaft and partially submerged in the electrolyte, the contact roll including a core member and a plurality of circumferentially spaced, electrically conductive segmental elements, elongated in the direction of the longitudinal axis of the shaft, affixed to the core member, the outermost surfaces of the plurality of segmental elements relative to the longitudinal axis of the shaft being of substantial area and falling in a cylinder having the longitudinal axis of the shaft as its center line,

d. an anode structure submerged in the electrolyte and having surface portions contiguous to but spaced from the electroplating roll,

e. an electrolyte retainer means surrounding the shaft where the shaft passes through the wall of the bath container means, and

f. means carried by said one end portion of the shaft outside of the bath container means for delivering electrical current selectively to each of the segmental elements.

3,900,384

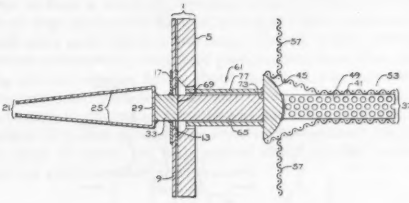
METHOD OF ASSEMBLING A BIPOLAR ELECTRODE HAVING FRICTION WELDED CONDUCTOR/CONNECTOR MEANS AND BIPOLAR ELECTRODE FORMED THEREBY

Leslie Gunby, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 309,310, Nov. 24, 1972, Pat. No. 3,813,326. This application Jan. 4, 1974, Ser. No. 430,977

Int. Cl. B01k *3/04*

U.S. Cl. 204—286 **7 Claims**



6. In a backplate comprising a catholyte-resistant steel plate, a cathode projecting from the catholyte-resistant steel plate, an anolyte-resistant titanium sheet, an anode projecting from the anolyte-resistant titanium sheet, and means for conducting electrical current from said cathode to said anode and connecting said anode and cathode to said backplate, the improvement wherein said conducting and connecting means comprises:

a copper member;

a catholyte-resistant steel member friction welded to one end of said copper member; and

an anolyte-resistant titanium member bonded to the opposite end of said copper member, the bond between said anolyte-resistant titanium member and said copper member having an electrical conductivity of greater than about 1.5×10^4 mho and having substantially no third phase between the copper member and the anolyte-resistant titanium member.

3,900,385

METHOD FOR CONTINUOUS PRODUCTION OF ELECTROLYTIC MANGANESE DIOXIDE

Akio Era, and Takeo Emoto, both of Tokyo, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1973, Ser. No. 423,760

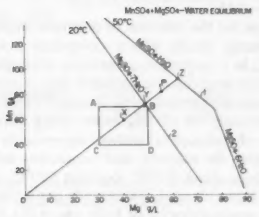
Claims priority, application Japan, Sept. 20, 1973, 48-106182

Int. Cl. C01b *45/02*

U.S. Cl. 204—96 **5 Claims**

1. In a method for continuous production of electrolytic manganese dioxide by electrolysis of an aqueous manganese sulfate - sulfuric acid solution containing 30 g/l or more of magnesium in the form of magnesium sulfate as impurity wherein consumed manganese is made up for by supplying a neutral aqueous manganese sulfate solution prepared by leaching of manganese ore which contains magnesium as impurity with spent electrolyte and sulfuric acid followed by neutralization and filtration;

the improvement comprising concentrating the whole amount of or a part of the neutral manganese sulfate solution in a vacuum at a temperature of between 40°C. and 60°C. to produce a solution having a concentration corresponding to a saturation point at from 15°C. to 60°C., and then rapidly cooling the resultant solution to 15°C. – 25°C., to give crystal containing magnesium sulfate, filtering away the crystal and feeding the filtrate to the electrolytic cell to make up for the whole amount of



or a part of consumed manganese, whereby the content of magnesium in the form of magnesium sulfate in the electrolyte is maintained at not more than 45 g/l.

3,900,386

HYDROPROCESSING OF HYDROCARBONS

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 365,782, May 31, 1973, which is a continuation-in-part of Ser. No. 27,457, April 10, 1970, abandoned. This application Feb. 15, 1974, Ser. No. 443,046

Int. Cl. C10g *13/02;* **C01b** *33/28*

U.S. Cl. 208—111 **11 Claims**

1. A hydrocarbon hydroprocess which comprises reacting a hydrocarbon with hydrogen at conditions selected to effect chemical consumption of hydrogen, and in contact with a catalytic composite of a platinum or palladium component, an iridium component, a germanium component and a porous carrier material, substantially all of the platinum or palladium component and the iridium component being in the elemental metallic state and the germanium component being in an oxidation state above that of the elemental metal.

3,900,387

HYDROCARBON CONVERSION WITH A MULTIMETALLIC CATALYTIC COMPOSITE

Frederick C. Wilhelm, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 233,819, March 10, 1972, Pat. No. 3,798,155. This application Jan. 24, 1974, Ser. No. 436,305

Int. Cl. C10g *35/08;* **B01j** *11/78;* **C07c** *5/28*

U.S. Cl. 208—139 **21 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with a catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 5 wt. % Group IVA metal selected from germanium and tin, about 0.1 to about 3.5 wt. % halogen and bismuth in an amount sufficient to result in an atomic ratio of bismuth to platinum group metal of about 0.1:1 to about 1:1, wherein the platinum group metal, Group IVA metal, and bismuth are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal and bismuth are present in the corresponding elemental metallic states and wherein substantially all of the Group IVA metal is present in an oxidation state above that of the corresponding elemental metal.

3,900,388

REMOVAL OF AROMATIC IMPURITIES

Lee Hilfman, Mt. Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 30, 1973, Ser. No. 383,754
Int. Cl. C10g *23/02*
U.S. Cl. 208—143 6 Claims

1. A process for the removal of aromatic impurities from a paraffinic charge stock which comprises contacting said charge stock, in a hydrogen-containing atmosphere, with an inorganic oxide support impregnated with a catalytically effective amount of a metal from Group VIII of the Periodic Table, substantially all of said metal being dispersed on the outer surface of said support without appreciable dispersion of the metal within the support, said contacting being at a temperature of from about 200°C. to about 500°C., a pressure of from about 100 to about 4,000 pounds per square inch and a liquid hourly space velocity of from about 0.1 to about 10.0 and recovering the resultant paraffinic charge stock of reduced aromatic content.

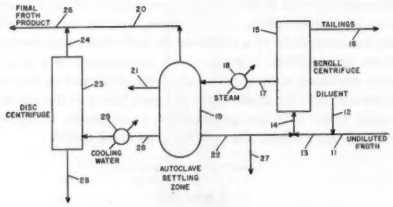
Tar Sands

3,900,389

METHOD FOR UPGRADING BITUMINOUS FROTH

Robert A. Baillie, West Chester, Pa., assignor to Great Canadian Oil Sands Limited, Toronto, Canada

Filed Aug. 12, 1974, Ser. No. 496,775
Int. Cl. C10g *33/04*
U.S. Cl. 208—188 4 Claims



1. A method of removing mineral matter and water from a bituminous froth containing bitumen, mineral matter, and water comprising:

a. diluting said froth with a liquid hydrocarbon boiling in the range of 350°–750°F.;

b. centrifuging said diluted froth in a centrifuge to separate a centrifugal tailings stream from a centrifugal froth;

c. heating said centrifugal froth to a temperature in the range of 300°–1000°F.;

d. settling said heated centrifugal froth in an autoclave settling zone at a temperature in the range of 300°–1000°F. and a pressure in the range of 0–1000 psig to provide a froth product layer, a water layer, and a tailings layer; and

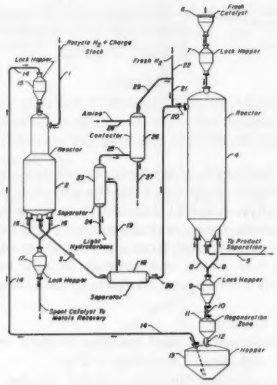
e. recovering from said settling zone said bitumen froth product substantially reduced in mineral matter and water.

3,900,390

METAL, SULFUR AND NITROGEN REMOVAL FROM HYDROCARBONS UTILIZING MOVING-BED REACTORS

Frank H. Adams, and Robert F. Anderson, both of Lagrange Park, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 282,999, Aug. 23, 1972, Pat. No. 3,795,607. This application Oct. 24, 1973, Ser. No. 409,216The portion of the term of this patent subsequent to Mar. 5, 1991, has been disclaimed.
Int. Cl. C10g *23/08*
U.S. Cl. 208—210 4 Claims



1. A process for the catalytic hydroprocessing of hydrocarbons containing metal, sulfur and nitrogen impurities therein, said process having at least two moving-bed reactors operated with series hydrocarbon flow which comprises the steps of:

a. passing a hydrocarbon charge stock and hydrogen through a first moving-bed reaction zone to contact regenerated catalyst hereinafter described, said catalyst flowing downward in said first reaction zone to remove metal impurities from said charge stock;

b. passing a portion of the reaction effluent from the first reaction zone to the top of a second moving-bed reaction zone to contact therein fresh catalyst flowing downward in said second reaction zone to remove sulfur and nitrogen impurities from said effluent;

c. removing used catalyst from the bottom of said second reaction zone;

d. contacting said used catalyst with an oxygen-containing gas in a regeneration zone to burn off accumulated carbon deposits to form regenerated catalyst;

e. passing regenerated catalyst formed in step (d) into said first reaction zone as said regenerated catalyst of step (a); and,

f. withdrawing said regenerated catalyst containing said metal impurities from the bottom of said first reaction zone.

3,900,391

METHOD OF MAKING A PUMPABLE SLURRY FROM WAXY CRUDE OIL

La Vaun S. Merrill, Jr., Englewood; Dennis E. Drayer, Littleton; William B. Gogarty, Littleton, and George A. Pouska, Littleton, all of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 290,205, Sept. 18, 1972, Pat. No. 3,804,752. This application Apr. 26, 1973, Ser. No. 354,604The portion of the term of this patent subsequent to Apr. 16, 1991, has been disclaimed.

Int. Cl. C10g *43/04*

U.S. Cl. 208—370 41 Claims

1. A process for preparing a hydrocarbon slurry from a hydrocarbon mixture that can be effectively transported, the process comprising fractionating the hydrocarbon mixture into at least a relatively low pour point fraction and a relatively high pour point fraction, taking at least a portion of the high pour point fraction and congealing all of said portion to obtain substantially congealed particles and thereafter slurrying at a temperature below about the solution temperature of the congealed particles in the slurry, at least a portion of the substantially congealed particles in a liquid hydrocarbon comprised of at least pour point portion of the relatively low pour fraction, to obtain the hydrocarbon slurry suitable for transport at predetermined temperatures.

3,900,392

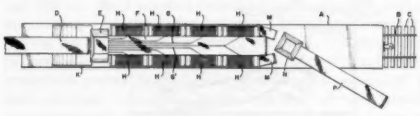
BALLAST CLEANER

Martin J. Speno, Syracuse, and Anthony T. Bruno, East Syracuse, both of N.Y., assignors to Frank Speno Railroad Ballast Cleaning Company, Inc., Ithaca, N.Y.

Filed Nov. 28, 1973, Ser. No. 419,876

Int. Cl.[2] B07B *1/00*

U.S. Cl. 209—241 11 Claims



1. A ballast cleaner for transport by a railroad car along the rails of a railroad track comprising: An infeed conveyor for dirty ballast supported on said car and having an operative run at an elevation substantially above said car, moving longitudinally of the car in a direction parallel to the said rails; means for removing dirty ballast in lateral directions continuously and in substantially equal streams from said conveyor at locations spaced apart longitudinally thereof; a longitudinal row of shaker screens beneath the infeed conveyor at the respective said locations for reception of the respective increments of dirty ballast; said screens all having discharge ends beneath said infeed conveyor for discharge of cleaned ballast, transversely to the infeed conveyor movement; a longitudinally moving a clean ballast conveyor disposed for simultaneous reception of clean ballast from the discharge ends of the respective said shaker screens and for conveying said clean ballast to a predetermined discharge point; and a dirt conveyor extending longitudinally beneath all of the screens of said row for reception and removal of the dirt sifted through said screens.

3,900,393

RUBBER GROMMET ARRAY FOR SIZING SCREENS

Earl D. Wilson, Lodi, Calif., assignor to Randtron, Menlo Park, Calif.

Filed Nov. 5, 1973, Ser. No. 413,029

Int. Cl.[2] B07B *1/46*

U.S. Cl. 209—399 4 Claims

1. A rubber grommet array for a sizing screen which comprises a bed plate having a multiplicity of holes therein, and grommets individually engaged in such holes to define therein a wear-resistant lining, and the grommets together providing a wear-resistant facing on the bed plate; characterized by each rubber grommet being of one-piece and removably snap-engaged directly in the related hole in the bed plate and including a depending neck having an outside diameter greater than the inside diameter of said related bed plate hole, there being a circumferential groove in said neck and the latter tapering downwardly below the groove whereby to facilitate entry of the neck into such related hole and reception of the corresponding portion of the bed plate in such groove upon said snap-engagement of the grommet.

3,900,394

PROCESS FOR TOTAL SEWAGE TREATMENT

Paul I. Rongved, New York, N.Y., assignor to Activox, Inc., New York, N.Y.

Division of Ser. No. 260,295, June 6, 1972, abandoned. This application May 16, 1974, Ser. No. 470,392

Int. Cl. C02c *1/06*

U.S. Cl. 210—7 2 Claims

1. A continuous activated sludge sewage treatment process comprising, in continuous manner, injecting raw sewage liquid into a reservoir providing a single horizontal closed loop path, circulating the liquid around said path at a speed of at least about 0.8 feet per second and sufficient to avoid substantial settling of sludge suspended therein, aerating the liquid in said path to promote aerobic decomposition of the sewage and formation of nitrate compounds in said liquid, circulating the aerated liquid around said path for a first distance in which said decomposition proceeds until the liquid is substantially devoid of oxygen at the point of raw sewage injection, circulating the liquid containing nitrate compounds and raw sewage around said path for a second distance in which denitrification proceeds in said liquid until it reaches the next point of aeration in said path, continuously removing treated liquid, for clarification and settling of sludge therein, at a rate approxi-

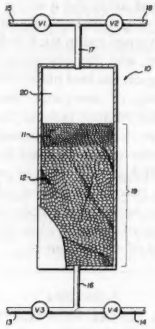
mating the rate of injection of the raw sewage liquid, discharging the resulting clarified liquid effluent and returning at least a portion of the settled sludge to the liquid in said reservoir, the average retention time of the liquid in the reservoir being at least about 24 hours, said second distance being at least about 10% of the sum of said first and second distances.

3,900,395

METHOD OF AND APPARATUS FOR FILTERING

Gene Hirs, Birmingham, Mich., assignor to Hydromation Filter Company, Livonia, Mich.

Filed Aug. 16, 1973, Ser. No. 389,061
Int. Cl.[2] B01D *23/10*
U.S. Cl. 210—80 **3 Claims**



1. In a filtering apparatus for removing particulate contaminants from liquids, said apparatus having:

an anthracite coal filter media bed characterized by primary filter granules and smaller, fine, relatively flat, flaky particles, said bed having upper inlet and lower outlet surfaces and said smaller fine particles tending to accumulate in the region of the inlet surface after backwashing to thereby inhibit penetration into said anthracite media bed by particulate contaminants,

the improvement of a layer of granulated black walnut shells positioned on the inlet surface of said anthracite media bed, said black walnut shells being selected to have a size and shape in relation to the fine anthracite particles for intermixing therewith after backwashing and having an angular, three-dimensional configuration to inhibit blinding off of said bed of anthracite coal by said fine particles and accumulated contaminants, a portion of said black walnut shells being intermixed in the inlet surface of the filter media bed with at least a portion of the smaller fine particles,

said layer of granulated walnut shells improving the filter capabilities of said bed by enabling more effective penetration of said inlet surface by said particulate contaminants.

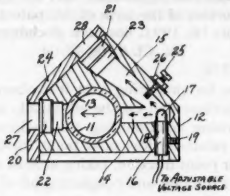
3,900,396

BLOOD LEAK DETECTOR

Rene G. Lamadrid, Bethesda, Md., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Mar. 22, 1974, Ser. No. 453,751
Int. Cl.[2] B01D *35/14*
U.S. Cl. 210—94 **10 Claims**

1. In an artificial kidney machine, a blood leakage detector comprising a transparent flow conduit containing dialysate from the artificial kidney machine, an opaque block of heat-absorbing material having a bore closely receiving said conduit, said block being formed with a pair of intersecting divergent light passages, one of said passages traversing said conduit substantially perpendicularly thereto and the other being clear of the conduit and defining an independent clear reference passage, a light source mounted in the block at the intersection of said passages, respective photosensitive elements mounted in the block at the end portions of said passages, and



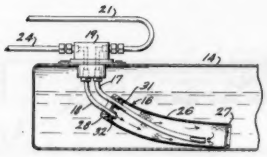
alarm circuit means operatively connected to said photosensitive elements and operating responsive to differences in intensity of the light reaching said photosensitive elements through said passages caused by light absorbance due to the presence of blood in the flow conduit.

3,900,397

FUEL TANK FILTER

Rupert B. Bell, Grosse Pointe, Mich., assignor to R. L. Kuss & Co., Inc., Findlay, Ohio

Filed June 10, 1974, Ser. No. 477,659
Int. Cl.[2] B01D *35/02*
U.S. Cl. 210—128 **4 Claims**



1. In an automobile fuel system having a fuel tank, a fuel feeding means for introducing fuel to the vehicle engine including a stop valve for terminating the flow of fuel to the fuel feeding means, a fuel pump, a fuel pump line connecting the fuel pump with the fuel feeding means and a fuel feed line connecting the fuel tank with the inlet side of the fuel pump, and means for bypassing the fuel pump line in response to the closing of the stop valve, the improvement comprising a fuel filter within the fuel tank, said fuel filter having a filtering mesh and closure means defining an interior with upstream and downstream ends and an outlet tube and an inlet tube extending into the interior, means operably connecting said outlet tube with said fuel feed line, and means operably connecting said inlet tube with the bypassing means, whereby upon closure of the stop valve of the fuel feeding means, substantially all of the fuel returned by the bypassing means exits said inlet tube within said filter and re-enters said outlet tube, a substantially zero pressure drop occurs across the filtering mesh, and the filtering mesh is cleaned of filtrate material by sloshing action of the fuel in the tank.

3,900,398

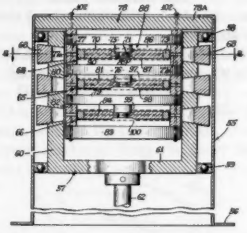
SYSTEM FOR EXCHANGING BLOOD ULTRAFILTRATE

Deighton D. Gillette, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Division of Ser. No. 167,571, July 30, 1971, Pat. No. 3,788,319. This application Sept. 24, 1973, Ser. No. 400,388

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—196 5 Claims



1. Ultrafiltration apparatus comprising: housing means providing a plurality of filtering sections each defining a closed chamber; a disc-shaped impeller having an upper and a lower surface and rotatably mounted in each chamber and defining a plurality of spiral channels extending outwardly from the center to the periphery thereof, each channel alternately communicating with the space above and below its associated channel, for communicating a fluid therein alternately with the upper and lower sides thereof at a plurality of locations spaced progressively along said channel; first and second filtering membranes for each chamber and mounted respectively above and below an associated impeller; first conduit means associated with each chamber for coupling a fluid to be processed to the center of its associated impeller and into said channels; second conduit means for each chamber communicating with said chamber at locations above said upper membrane and below said lower membrane for collecting fluid passing through said membranes and for returning said filtrate; third conduit means for each chamber and communicating with the space between said membranes for collecting the filtrand; and powered means for rotating said impellers, whereby as said impellers are rotated, the fluid to be processed passes through said first conduit means of each filter section, enters the center portion of said impellers, passes through said channels under centrifugal force alternately contacting said first and second filter means at a plurality of progressively outwardly spaced locations during said passage, and the filtrate is collected by said second conduit means whereas the filtrand is passed to said third conduit means.

3,900,399

FILTER APPARATUS FOR EXTRUSION PRESSES

Joachim Kreyenborg, Raesfeldstr. 67/69, 44 Munster, Germany, and Udo Kreyenborg, Munster Str. 371, 44 Munster, Germany

Filed Nov. 2, 1973, Ser. No. 412,189

Claims priority, application Germany, Nov. 18, 1972, 2256639

Int. Cl.[2] B01D *27/08*

U.S. Cl. 210—236 4 Claims

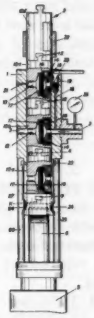
1. Appratus for processing plastic material, and comprising:

a. a housing having an axial bore of predetermined length and a transverse bore, extending through said axial bore, for connection to a source of plastic material;

b. filtering means mounted in said axial bore for movement axially therein, and including a plurality of screen chambers spaced therealong and having through bores adapted for alignment with said transverse bore, and

c. power means for advancing said filtering means through said axial bore to bring said through bores successively into alignment with said transverse bore,

in which apparatus said filtering means comprises a plurality of adjacent, individual screen supporting cylinders shorter than said axial bore, each including at least one of said screen chambers and each having complimentary coupling means



extending transversely across its ends for form-locking connection with adjacent cylinders to prevent rotation and axial separation therebetween, wherein said complimentary coupling means comprises:

d. a transverse T-shaped tongue on one end of each screen supporting cylinder; and

e. a cooperating transverse T-shaped groove formed in the other end of each screen supporting cylinder.

3,900,400

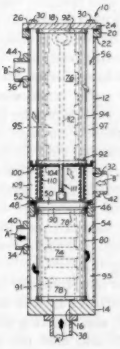
DUAL FILTER ARRANGEMENT

Joseph A. Whitfield, Peoria, Ill., assignor to Caterpillar Tractor Company, Peoria, Ill.

Filed Apr. 29, 1974, Ser. No. 465,328

Int. Cl.[2] B01D *27/08*

U.S. Cl. 210—238 9 Claims



1. A dual filter arrangement comprising;

an elongated housing having a removably closable end;

a pair of hollow filter elements removably disposable in said housing in axially spaced relation and individually defining a filter chamber centrally therein;

divider wall means removably disposable within the housing intermediate said filter elements dividing the housing into a pair of axially spaced and independent filter compartments, said divider wall means including a pair of axially spaced apart divider walls defining a fluid transfer chamber therebetween within the housing between adjacent ends of said pair of filter elements with one of said divider walls having an opening therethrough communicating said transfer chamber with one of said filter chambers;

said housing having a fluid inlet port and a fluid outlet port for each compartment with one of said ports being in fluid communication with said fluid transfer chamber; and

means connected to said divider wall means for withdrawing said divider wall means and both of said filter elements as a unit from said removably closable end of said housing.

3,900,401

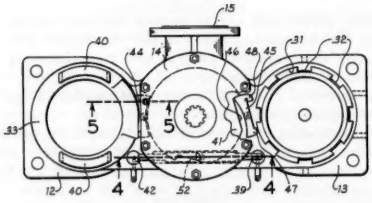
DUAL FILTER FOR LUBRICATING OIL

Haven D. Oliver, South Portland, Maine; Richard K. Burke, Groton, Conn.; Herbert Dobson, Jr., Bradford, R.I., and Leon E. Grant, Colchester, Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 4, 1974, Ser. No. 520,327

Int. Cl.[2] B01D *27/08*

U.S. Cl. 210—238 **3 Claims**



1. A dual filtering device for lubricating oil comprising,

a housing having first and second filtering sections separated by a flow control section, said first and second filtering sections each being closed at one end and having an opening at the other end with a plurality of housing lugs disposed about the periphery of each opening, said flow control section having an inlet and an outlet for lubricating oil,

an aperture in one of said housing lugs,

a shaft rotatably positioned in said flow control section,

first and second filter elements positioned one each in said first and second filtering sections,

a first valve positioned in said inlet and connected with said shaft and a second valve positioned in said outlet and connected with said shaft whereby flow of lubricating oil can be selectively passed through said first and second filter elements by rotating said shaft,

first and second covers closing the openings, respectively, in said first and second filtering section, each said cover having a plurality of cover lugs engageable with said housing lugs to lock said covers with said housings when said covers are rotated and said cover lugs are positioned beneath said housing lugs,

a pin in each said cover adaptable for engagement one each with one of said apertures in said housing lugs whereby pressure within each said filtering section lifts said cover associated therewith and said pin enters said aperture thereby preventing rotation of said cover,

a timing disk attached to said shaft, and

first and second pawls pivotally attached to said housing and engageable with said timing disk to prevent rotation of said shaft, said first pawl being engageable with said first cover for biasing said pawl out of engagement with said timing disk and said second pawl being engageable with said second cover for biasing said pawl out of engagement with said timing disk whereby said shaft can only be rotated to connect said inlet and outlet valves to a filtering section that has a cover thereon.

3,900,402

HEMODIALYZER

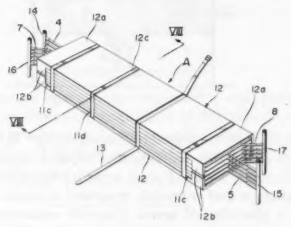
Risaburo Aoki, No. 16-1, Ohtsukamachi, Yukigaya, Ohta-ku, Tokyo, Japan

Filed Mar. 12, 1973, Ser. No. 339,970

Claims priority, application Japan, Jan. 19, 1973, 48-8782

Int. Cl. B01d *13/00, 31/00*

U.S. Cl. 210—321 **5 Claims**



1. A hemodialyzer comprising at least one dialyzer pack including a flat dialyzer tube, a fibrous sheet of paper-like material directly over the outer surface of said dialyzer tube, a net directly over the outer surface of said fibrous sheet, and a flat sealed outer sack enclosing said dialyzer tube, fibrous sheet and net.

3,900,403

FILTRATION APPARATUS

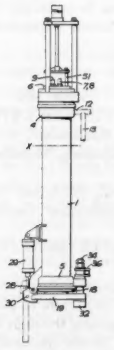
Raymond Thomas Randle, Hartlepool; John Williamson, Hart, near Hartlepool, and David Wilson, Hartlepool, all of England, assignors to Steetley (Mfg.) Limited, Worksop, England

Filed Mar. 25, 1974, Ser. No. 454,276

Claims priority, application United Kingdom, Mar. 29, 1973, 15223/73; Oct. 26, 1973, 50000/73

Int. Cl.[2] B01D *29/42*

U.S. Cl. 210—350 **10 Claims**



1. A filtration apparatus which comprises a cylindrical housing accommodating therein a stationary, hollow, perfo-

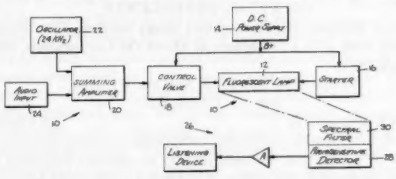
rated, cylindrical body fixedly secured thereto and thus creating an annular space defined by the inside of the housing and the outside of the cylindrical body, an impermeable elastic sleeve disposed within said annular space and fixed at its opposite ends to said housing thereby dividing the annular space into an inner filtration compartment and an outer pressure applying compartment, a filter element disposed around and supported by the cylindrical body, outlet means connected with the interior of said cylindrical body for the discharge of filtrate which has passed through the filter element into the cylindrical body, an inlet into the inner filtration compartment for liquid/solid mixtures, an inlet into the outer pressure applying compartment for a hydraulic fluid under pressure, said housing having an annular opening at its lower end below the lower end of said cylindrical body, means for dislodging filter cake from said filter element, and a pivoted end plate hinged to said housing for closing said annular opening, said end plate, when in the open position, constructed and arranged to permit discharge from the inner filtration compartment of filter cake dislodged from said filter element.

3,900,404

OPTICAL COMMUNICATION SYSTEM

Martin R. Dachs, 37 Pine St., New City, N.Y. 10596

Filed Aug. 2, 1973, Ser. No. 384,798
Int. Cl. H04b *9/00*
U.S. Cl. 250—199 **4 Claims**



1. The transmitter of an optical communication system comprising:

a fluorescent lamp,

audio signal means to provide an audio frequency signal for conveying whatever audio communication is to be transmitted,

oscillator means to provide a super audible frequency signal,

a summing amplifier coupled to said audio signal and to said super audible signal to provide a sum signal, and

a control valve responsive to said sum signal and coupled to said fluorescent lamp, to vary the current through said fluorescent lamp as a function of said sum signal,

said fluorescent lamp providing a light output varying in intensity as a function of said audio signal.

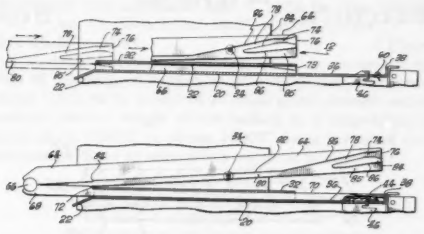
3,900,405

CASSETTE OPENING MECHANISM

Fred J. Bartlett, San Dimas; Paul A. Bevis, Pasadena; Hazen L. Hoyt, III, Glendora, and Francis T. Mercer, Manhattan Beach, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 310,305, Nov. 29, 1972, abandoned, which is a continuation of Ser. No. 61,297, Aug. 5, 1970, abandoned. This application Oct. 7, 1974, Ser. No. 512,634
Int. Cl. G03b *41/16*
U.S. Cl. 250—468 **41 Claims**

1. A mechanism adapted to rotate the cover of a cassette between open and closed positions, said mechanism comprising means to receive a cassette, guide means disposed on opposite sides of the cassette-receiving means for guiding the cassette into the cassette-receiving means, means for holding the base member of the cassette along the plane in which the base member is inserted into the cassette-receiving means, and means rigidly mounted on each side guide means for cooperating with at least one groove in each adjacent side wall



of the cover for rotating the cover between the open and closed positions upon insertion and withdrawal, respectively, of the cassette from the cassette-receiving means.

3,900,406

AQUEOUS GELS AND USES THEREOF

Richard L. Clampitt, and James E. Hessert, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 159,052, July 1, 1971, Pat. No. 3,727,687. This application Oct. 30, 1972, Ser. No. 301,953
Int. Cl. E21b *21/04*
U.S. Cl. 252—8.55 C **23 Claims**

1. An aqueous medium, comprising water to which there has been added:

a water-thickening amount of a water-soluble cellulose ether;

an amount of a water-soluble compound of a polyvalent metal wherein the valence state of the metal therein is capable of being reduced to a lower polyvalent valence state and which is sufficient to supply at least about 3×10^{-6} gram atoms of said polyvalent metal per gram of said cellulose ether; and

an amount of a water-soluble reducing agent which is effective to reduce at least a portion of said metal to said lower valence state; said reducing agent being selected from the group consisting of hydroquinone, sodium sulfide, sodium hydrosulfite, sodium metabisulfite, potassium sulfite, sodium bisulfite, potassium metabisulfite, sodium sulfite, sodium thiosulfate, p-hydrazinobenzoic acid, hydrazine phosphite, hydrazine dihydrochloride, acetamide, and mixtures thereof.

3,900,407

COMPOSITION FOR CLEANING AND GLAZING FURS

Benjamin Kaufman, Philadelphia, Pa., assignor to Colgate-Palmolive Company, New York, N.Y.

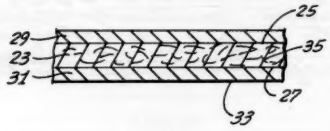
Filed Dec. 14, 1972, Ser. No. 315,256
Int. Cl. C11d *9/46;* **D06m** *13/00*
U.S. Cl. 252—8.57 **1 Claim**

1. A composition for cleaning and glazing fur consisting essentially of a uniform mixture of about 0.05 to 0.2 weight percent of potassium oleate, about 0.05 to 0.2 weight percent of a non-soap detergent selected from the group consisting of anionic and non-ionic detergents, about 0.02 to 0.1 weight percent of a terpene oil, about 0.05 to 0.2 weight percent of a liquid silicone oil, about 15 to 50 weight percent of an alcohol selected from the group consisting of methanol, ethanol, propanol, and isopropyl alcohol, with the remainder being water.

3,900,408
BEARING LINER

Peter H. Turner, Burbank, Calif., assignor to Sargent Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 274,606, July 24, 1972, abandoned. This application June 3, 1974, Ser. No. 475,622
Int. Cl. F16c *9/06*
U.S. Cl. 252—12.6 23 Claims



1. A liner for reducing the coefficient of friction between first and second surfaces movable relative to each other, comprising:

a fibrous backing having first and second major surfaces and having chopped and compressed fibers to reinforce the liner;

an adhesive layer in fixed relationship with the first major surface of the backing for bonding the backing to the first surface; and

a low friction layer in fixed relationship with the second major surface of the backing and providing a low friction surface for slidably engaging the second surface, the low friction layer having a thin dimension relative to the second major surface and being formed from small portions of low friction material interspersed in an adhesive; whereby

the second and low friction surfaces have a lower coefficient of friction than the first and second surfaces.

3,900,409
LUBRICATING OIL COMPOSITIONS CONTAINING SULFURCHLORINATED STYRENE DERIVATIVES

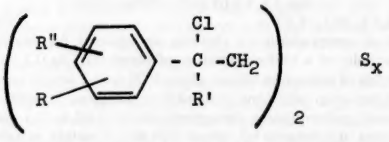
Raymond S. Dalter, Montgomery, and Sidney S. White, Westchester, both of Ohio, assignors to Cincinnati Milacron Chemicals Inc., Reading, Ohio

Filed Jan. 10, 1974, Ser. No. 432,395
Int. Cl. C10m *1/42, 3/36*
U.S. Cl. 252—48.8 16 Claims

1. A lubricating oil composition comprising:

a. a major amount of a lubricating oil; and

b. a minor amount sufficient to improve extreme pressure properties thereof of an additive having the formula:



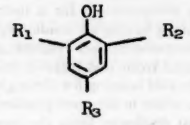
where R is hydrogen, alkyl of 1 to 4 carbon atoms or chlorine, R'' is hydrogen or chlorine, R' is hydrogen or methyl and *x* is a number from 1 to 10.

3,900,410
LUBRICATING OIL COMPOSITIONS CONTAINING TRIALKYL-SUBSTITUTED PHENOLS AND BENZOTRIAZOLE

Robert E. Malec, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 23, 1973, Ser. No. 353,394
Int. Cl. C10m *1/32*
U.S. Cl. 252—51.5 R 9 Claims

1. A mineral lubricating oil composition containing an antioxidant amount of a compound having the formula:



wherein R_1 and R_2 are tert-alkyl groups containing 4 to about 20 carbon atoms and R_3 is a straight chain primary alkyl group containing 8 to about 24 carbon atoms and an antioxidant promoter amount of a benzotriazole.

3,900,411
LUBRICANT COMPOSITIONS CONTAINING ACETAL OR KETAL DETERGENTS

Harry J. Andress, Jr., Pitman, and Henry Ashjian, East Brunswick, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 19, 1973, Ser. No. 417,165
Int. Cl. C10m *1/20*
U.S. Cl. 252—52 R 15 Claims

1. A lubricant composition comprising a major amount of an oil of lubricating viscosity and, in an amount sufficient to impart detergent properties, a carbonyl compound selected from the group consisting of alkenylsuccinic acid-polyhydric alcohol ester acetals or ketals, wherein the alkenyl group contains at least about 30 carbon atoms.

3,900,412
LIQUID TONERS WITH AN AMPHIPATHIC GRAFT TYPE POLYMERIC MOLECULE

George E. Kosel, Park Ridge, N.J., assignor to Philip A. Hunt Chemical Corporation, Palisades Park, N.J.

Division of Ser. No. 7,253, Jan. 30, 1970, abandoned, which is a continuation-in-part of Ser. No. 810,841, March 26, 1969, abandoned. This application Apr. 30, 1973, Ser. No. 355,567
Int. Cl. G03g *9/04*
U.S. Cl. 252—62.1 26 Claims

1. A liquid electrostatographic toner essentially comprising a liquid solvent system, amphipathic polymeric molecules of the graft type each having a polymeric backbone part and a polymeric graft part on said backbone part, each of said molecules being composed of two moieties of which at least one is thermoplastic, said first moiety, which is one of said parts, being solvated by said system, a portion of said first moiety being a dispersant and a fixative to bond the molecules to a substrate, and a second moiety, which is the other of said parts, being insoluble in said system, said second moiety having a particle size between 25mμ and 25μ, a portion of said second moiety being a fixative to bond the molecules to a substrate, so that there is provided a continuous phase constituting the solvent system with the first moieties of the molecules dissolved therein and a dispersed phase constituting the non-solvated moieties of the molecules whereby said molecules act as a mono-dispersed particle phase, a fixative and a dispersant, and a charge director.

3,900,413

REACTIVE DEVELOPER FOR ELECTROPHOTOGRAPHY

Kenneth A. Metcalfe, Lockleys, and Alwin S. Clements, Largs Bay, both of Australia, assignors to The Commonwealth of Australia, Canberra, Australia

Filed June 6, 1973, Ser. No. 367,402

Claims priority, application Australia, June 15, 1972, 9341/72

Int. Cl.[2] G03G 9/04

U.S. Cl. 252—62.1 12 Claims

1. A developer for electrophotography comprising an insulating carrier liquid having an electrical resistivity of at least 10^{10} ohm-centimeter and developer particles suspended in said carrier liquid and being electrically conductive so as to be movable in the carrier liquid under the influence of an electrical field, said developer particles being reactively produced in situ in said carrier liquid and being constituted by the reaction product of at least two substances both soluble in said carrier liquid, one being a substance which is electrically insulative relative to the carrier liquid and which does not reduce the electrical resistivity of the carrier liquid when dissolved therein, the other substance being a substance which is electrically conductive relative to the carrier liquid and reduces the electrical resistivity of the carrier liquid when dissolved therein, said substances forming, when in dissolved state in said carrier liquid said conductive developer particles, the relative quantities of said two substances being so selected that there is no surplus of the relatively conductive substance after reaction in the carrier liquid to insure that the resistivity of the carrier liquid is not lowered in its insulating value, said developer particles by virtue of being formed in said carrier liquid being shielded against oxidation and being held in said liquid until used as a developer, said carrier liquid being a hydrocarbon liquid, said substance of greater insulating value being selected from the group consisting of: Quinalizarin, anthranilic acid, Alizarin, Hydroquinone, Chloranil, symdiphenylcarbazide, diphenylthiocarbazide, 2-Furoic Acid, Tetrachlorophthalic anhydride, fumaric acid, Naphthalene -2-Sulphonic Acid, Citral, Cinnomoldehyde and Diphenylamine, said substance which is more conductive being selected from the group consisting of: cobalt octoate, the octoates and naphthenates of zinc, lead, manganese, copper, zirconium, iron and chromium, copper nonyl phthalate and ferric chloride.

3,900,414

ELECTROPHOTOGRAPHIC DEVELOPER

Elinor J. Tanck, Cupertino; Lauren L. Hulse, and Paul P. Kelly, both of Saratoga, all of Calif., assignors to Memorex Corporation, Santa Clara, Calif.

Division of Ser. No. 293,082, Sept. 28, 1972, Pat. No. 3,806,458. This application Jan. 30, 1974, Ser. No. 437,945

Int. Cl. G03g 9/02

U.S. Cl. 252—62.1 P 1 Claim

1. Carrier particles for xerographic toner consisting essentially of 200–600 micron mean diameter particles of steel shot thinly coated with a mixture of a copolymer of methyl methacrylate and ethyl acrylate having a glass transition temperature at least 50°C. and below 100°C., and a cellulose acetate butyrate resin containing less than 60% by weight acetate plus butyrate.

3,900,415

MAGNETIC GLASS

Thomas E. Lee, Baton Rouge, and Sebastian M. Laurent, Greenwell Springs, both of La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 184,291, Sept. 27, 1971, abandoned. This application Sept. 4, 1973, Ser. No. 394,046

Int. Cl. C04b 35/00; H01f 1/00; C03c 3/04

U.S. Cl. 252—62.51 8 Claims

1. A method of preparing a magnetic glass comprising the step of calcining or heating in an oxygen free atmosphere about 1–5 parts by weight of an alkali metal alumino silicate and one part by weight of iron sulfide, to a temperature of from about 1200°C to about 1600°C for a period of time sufficient to form an amorphous magnetic fraction.

3,900,416

ELECTRICAL DEVICES CONTAINING NITROARYLSILOXANE DIELECTRIC FLUID

Gary A. Vincent, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 20, 1973, Ser. No. 426,975

Int. Cl.[2] H01B 3/18; H01G 4/02

U.S. Cl. 252—63.7 16 Claims

1. In an electrical device containing a dielectric fluid, the improvement comprising employing as the dielectric fluid a siloxane which consists essentially of from 1 to 100 mole percent of $R_xR'_ySiO_{[4-(x+y)/2]}$ siloxane units wherein x has an average value of from 1 to 3, y has an average value of from 0 to 2, the sum of $x+y$ being from 1 to 3, R is a nitroaryl radical containing from 6 to 18 carbon atoms, and R′ is an alkyl, aryl, alkaryl or aralkyl radical containing from 1 to 18 carbon atoms, and from 0 to 99 mole percent $R''_zSiO_{(4-z)/2}$ siloxane units wherein z has an average value from 0 to 3 and R″ is an alkyl, aryl, alkaryl or aralkyl radical containing from 1 to 18 carbon atoms.

4. A transformer as defined in claim 3 wherein in the siloxane R contains from 6 to 12 carbon atoms, R′ contains from 1 to 6 carbon atoms, and R″ contains from 1 to 6 carbon atoms.

3,900,417

METHOD AND APPARATUS FOR FORMING SUBMICRON DIPOLE PARTICLES

Alvin M. Marks, Whitestone, N.Y.

Division of Ser. No. 11,176, Feb. 13, 1970, Pat. No. 3,709,828. This application Jan. 2, 1973, Ser. No. 320,172

Int. Cl.[2] F21V 9/00; G02B 5/20; G02C 7/10; G03C

U.S. Cl. 252—300 10 Claims

1. A method of forming submicron particles of controlled average dimensions from dipole-forming reactants which comprises, providing at least two reactant fluids, mixing said reactant fluids together in substantially stoichiometric relationship to form a dipole precipitate by forming a jet stream of at least one of said reactants and a jet stream of at least one other of said reactants, then causing said jet streams to impinge one on the other and effect mixing thereof over a predetermined distance at a predetermined flow rate to thereby form said dipole precipitate having desirable predetermined average dimensions, wherein said fluids are both solutions which after having been mixed by impingement of said streams are collected in a reaction chamber which is refrigerated to increase the supersaturation, to thereby form a great many nuclei and many small crystals and to also inhibit the growth of large crystals of the dipole precipitate, forming said precipitate as a solution suspension, and stabilizing the suspension by exposing said dipole crystals to oxygen ions from a proportionately small quantity of a free oxygen ion emitting agent in said solution suspension.

8. A method of stabilizing a dipole precipitate of herapathite in a suspension solution which comprises exposing said herapthite dipole to oxygen ions from a proportionately small

quantity of a free oxygen ion emitting agent in said solution suspension.

3,900,418

ELECTROCHEMICAL LUMINESCENT SOLUTIONS AND DEVICES INCORPORATING SUCH SOLUTIONS

Allen J. Bard, and Nurhan E. Takvoryan, both of Austin, Tex., assignors to Bell-Northern Research, Ltd., Canada

Filed Apr. 12, 1973, Ser. No. 350,497

Int. Cl.[2] C09K *11/48*

U.S. Cl. 252—301.2 R 21 Claims

1. An electrically conducting electrochemical luminescent solution for use in an electro-generated chemical luminescent device operating at a predetermined potential, said solution comprising a fluorescent metal chelate luminescor, an aprotic solvent for said metal chelate, and an electrolyte comprising an organic compound electroinactive at said potential, said metal chelate being capable of producing stable ion radicals at said predetermined potential, the radicals taking part in a reaction in which excited states are formed and then annihilated with eventual emission of light, said solution being substantially free of O_2 and water, said chelate being the most readily oxidized or reduced constituent in said solution, the metal component of said chelate being selected from the group consisting of ruthenium, platinum and palladium and the ligand component of said chelate being selected from the group consisting of bipyridine, 1,10-phenanthroline, 2,2′2″-terpyridine and tetraphenylporphin.

3,900,419

BENZOFURANS

Hans Schlapfer, Basel, and Guglielmo Kabas, Binninger, Basel-Land, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

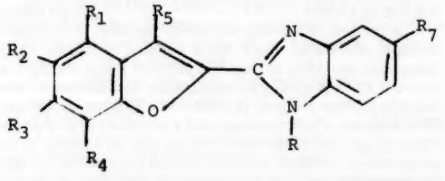
Division of Ser. No. 45,922, June 12, 1970, Pat. No. 3,772,323. This application July 16, 1973, Ser. No. 379,288

Claims priority, application Switzerland, June 27, 1969, 9863/69

Int. Cl. D06l *3/12*

U.S. Cl. 252—301.2 W 16 Claims

1. In a process for optically brightening a high molecular weight organic material by contacting said material with an optical brightener, the improvement comprising contacting said material with an effective amount of a solution or dispersion of a benzofuran of the formula



wherein

R is hydrogen, alkyl of 1 to 4 carbon atoms, hydroxy alkyl of 1 to 4 carbon atoms, phenyl, benzyl or cyclohexyl,

R_1 is hydrogen or, together with R_2 and the two carbon atoms to which R_1 and R_2 are attached, represent a fused benzene ring,

R_2 is hydrogen, halogen, or together with R_1 and the two carbon atoms to which R_1 and R_2 are attached, represent a fused benzene ring, R_3 is hydrogen, alkyl of 1 to 4 carbon atoms, or alkoxy of 1 to 4 carbon atoms,

R_4 is hydrogen or halogen,

R_5 is hydrogen, alkyl of 1 to 4 carbon atoms, or phenyl,

R_7 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, or halogen.

3,900,420

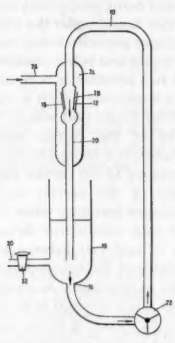
MICROGAS EMULSIONS AND METHOD OF FORMING SAME

Felix Sebba, c/o Department of Chemistry, University of the Witwatersrand, Jan Smuts Ave., Johannesburg, South Africa

Continuation-in-part of Ser. No. 38,347, May 18, 1970, abandoned. This application Sept. 14, 1972, Ser. No. 289,142

Int. Cl.[2] B01J *13/00*

U.S. Cl. 252—307 12 Claims



1. A microgas emulsion consisting essentially of from about 20% to 60% by volume undissolved gas in the form of spherical bubbles of colloidal size distributed in an aqueous liquid containing at least a small but effective amount of a soluble emulsifier to stabilize the emulsion, said emulsion having a viscosity which is not substantially greater than that of the liquid.

7. A method of forming a microgas emulsion from gas and an aqueous liquid containing at least a small but effective amount of a soluble emulsifier to stabilize the emulsion, said method comprising aspirating gas into a flowing body of said aqueous liquid thereby to form an emulsion of said gas in said liquid and aspirating gas into a flowing body of said emulsion thereby to increase the gas content thereof.

3,900,421

METHOD OF ACCELERATING THE BIODEGRADATION OF PETROLEUM PRODUCTS

Pierre Fusey, Paris, France, assignor to Societe Anonyme: Banque pour l'Expansion Industrielle "Banexi", Paris, France

Filed Feb. 13, 1973, Ser. No. 332,088

Claims priority, application France, Feb. 22, 1972, 72.05894

Int. Cl.[2] B01J *13/00*

U.S. Cl. 252—312 2 Claims

1. A method of accelerating the biodegradation of petroleum products, comprising mixing 100 parts by weight of the petroleum product to be biodegraded with about 30 parts by weight of a mixture of one part by weight of lecithin with one to five parts by weight of an emulsifier selected from the group consisting of sodium oleylisethionate, sodium laurylsulfate, sulphonated alpha-olefin, sarcosinate, 2-amino-2-hydroxymethyl-1, 3-propanediol, aminomethyl propanol, ethoxylated fatty acid, and ethoxylated fatty alcohol, and forming an emulsion of the mixture thus produced with water.

3,900,422

HEAVY METAL ADSORBENTS AND PROCESS FOR PRODUCING SAME

Kazuki Terajima; Shigeru Tomita; Yoshindo Matsuda, all of Tokyo, and Keiji Abe, Ohmiya, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Sept. 25, 1973, Ser. No. 400,645

Claims priority, application Japan, Sept. 26, 1972, 47-95762; Oct. 27, 1972, 47-107101

Int. Cl. C02b *1/52*

U.S. Cl. 252—426 13 Claims

1. A composition of matter comprising a granular mixture of nitrohumic acid and about 5–50 parts by weight per 100 parts of said nitrohumic acid of at least one carboxyl-containing polymeric binder selected from the group consisting of carboxymethylcellulose, carboxymethylstarch, alginic acid, pectinic acid, protein, polyacrylic acid, polymethacrylic acid, partially hydrolyzed polyacrylamide, partially hydrolyzed N-methylolated polyacrylamide, partially hydrolyzed N-methylolated polymethacrylamide and water-insoluble salts thereof.

3,900,423

PROCESS FOR BREAKING EMULSIONS

Sheldon B. Markofsky, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Mar. 28, 1973, Ser. No. 345,775

Int. Cl.[2] B01D *17/04*

U.S. Cl. 252—344 14 Claims

1. A process for demulsifying a water-in-oil or an oil-in-water emulsion which comprises subjecting the emulsion to the demulsifying action of an amount of demulsifying composition effective for demulsifying the emulsion and separating the resulting oil and water phases, the demulsifying composition being formed by:

admixing and reacting at 25°–125°C i. a member selected from a first group consisting of ammonia, a primary alkylamine having 4–12 carbon atoms per molecule, and a alkylenepolyamine having 4–12 carbon atoms per molecule and 1-6 primary amino groups per molecule; (ii) a member selected from a second group consisting of a secondary alkyl amine having 2–8 carbon atoms and 1–6 secondary amino groups per molecule and a secondary alkylenepolyamine having 3–28 carbon atoms per molecule and at least 1 secondary amino group per molecule; (iii) a member selected from a third group consisting of an epihalohydrin and a dihalohydrin having 3–10 carbon atoms per molecule; and (iv) water to from a mixture, the equivalent ratio of third group member to first group member being 1:0.009–0.5 and the equivalent ratio of the third group member to first group member plus second group member being 1:0.22–1.3 and the mole ratio of third group member to water being 1:1–100.

3,900,424

CATALYST FOR COPOLYMERIZING EPOXY COMPOUNDS WITH CARBON DIOXIDE

Shohei Inoue, Tokyo; Masaki Kanbe, Fujisawa; Tadamichi Takada, Yokohama; Nobuyuki Miyazaki, and Masanori Yokokawa, both of Fujisawa, all of Japan, assignors to Nippon Oil Seal Industry Company Limited, Tokyo, Japan

Filed July 18, 1973, Ser. No. 380,222

Claims priority, application Japan, July 21, 1972, 47-73616; July 24, 1972, 47-73443

Int. Cl. B01j *11/06, 11/82, 11/84*

U.S. Cl. 252—428 10 Claims

1. A catalyst composition consisting essentially of the reaction product of (a) an organometallic compound having the general formula R′*n*M wherein *n* is an integer, at least one R′ is selected from the group consisting of an alkyl group, halogen, hydroxy, alkoxy and hydrogen, the remaining R′ groups are selected from the group consisting of alkyl groups, alkaryl groups, aralkyl groups, aryl groups, halogen, hydroxy and alkoxy, and M is a metal element selected from the group consisting of those metal elements in groups II and III of the periodic Table, (b) at least one co-catalyst component selected from the group consisting of sulfur and compounds containing one or more active hydrogen atoms in a molar ratio to the organometallic compound within the range of from about 0.1 to about 5.0, and (c) carbon dioxide gas under a pressure at room temperature of from about 5 to about 50 kg/cm² and in a molar ratio to the organometallic compound of at least 1, said reactants having been reacted together at a temperature between room temperature and about 300° C for a time of from about 0.1 to about 100 hours.

3,900,425

CATALYST FOR OXIDATION OF HYDROCARBONS AND METHOD OF MAKING SAME

Eric Robinson, Lambeg, Northern Ireland, assignor to Lambeg Industrial Research Association, Lisburn, Northern Ireland

Continuation-in-part of Ser. No. 235,388, March 16, 1972, which is a continuation-in-part of Ser. No. 3,190, Jan. 15, 1970, abandoned. This application May 2, 1973, Ser. No. 356,490

Int. Cl. B01j *11/06, 11/08, 11/22*

U.S. Cl. 252—430 27 Claims

1. A composition which is the reaction product of a permanganate with a compound selected from the group consisting of lactose, sucrose, dextrin, glucose, starch, pectin, hemi-cellulose, alginic acid, a salt of alginic acid, a soluble cellulose derivative, a salt of a soluble cellulose derivative, polyvinyl alcohol and polyethylene glycol, said product containing an ion selected from the group consisting of boron, aluminum, chromium, iron, cobalt, nickel, copper, molybdenum, silver, lanthanum, cerium, praseodymium, osmium and mixtures thereof.

9. A process for preparing a catalyst composition, comprising adding a solution of a permanganate to a solution of a compound selected from the group consisting of lactose, sucrose, dextrin, glucose, starch, pectin, alginic acid, a salt of alginic acid, a soluble cellulose derivative, a salt of a soluble cellulose derivative, polyvinyl alcohol and polyethylene glycol, allowing the reaction mixture to gel or form a precipitate, separating the gel or precipitate from the liquor supernatent thereto and treating the gel or precipitate with a solution containing a salt of elements selected from the group consisting of boron, aluminum, chromium, iron, cobalt, nickel, copper, molybdenum, silver, lanthanum, cerium, praseodymium, osmium, and mixtures thereof.

3,900,426

CATALYSTS FOR THE OXIDATION OF OLEFINES

Vittorio Fattore; Paolo Moreschini, and Bruno Notari, all of San Donato, Milanese, Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Filed Sept. 1, 1972, Ser. No. 285,651

Claims priority, application Italy, Sept. 2, 1971, 28151/71

Int. Cl. B01j *11/74;* B01j *11/06*

U.S. Cl. 252—439 2 Claims

1. A catalyst for the oxidation of olefines corresponding to the following general formula

$Sb_pFe_mMe_nCo_pO_q$

wherein Me is a metal selected from tellurium and arsenic,

m is in the range of 0.1 to 1

n is in the range of 0 to 0.5

p is in the range of 0.005 to 1

q is in the range of 2.2 to 6.5

ALH

3,900,427

HYDROPROCESSING CATALYST

Kenneth L. Riley, and Willard H. Sawyer, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 101,957, Dec. 28, 1970, Pat. No. 3,770,617. This application June 4, 1973, Ser. No. 366,460

Int. Cl. B01j *11/40*

U.S. Cl. 252—455 R 13 Claims

1. A hydroprocessing catalyst comprising a hydrogenation component on an alumina support having a major portion of its surface area in pores ranging from 30–80A in diameter, with less than four percent of the total pore volume being in pores ranging from 200 to 2000A in diameter, and at least three percent of the total pore volume being in pores greater than 2000A in diameter.

3,900,428

CATALYST FOR THE REDUCTION OF NITRIC OXIDES

Gerhard Mai, Bruchkobel; Reiner Siepmann, Rodenbach, and Franz Kummer, Rossdorf, all of Germany, assignors to W. C. Heraeus GmbH, Hanau, Germany

Continuation-in-part of Ser. No. 295,790, Oct. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 284,323, Aug. 28, 1972, abandoned. This application Sept. 7, 1973, Ser. No. 395,090

Claims priority, application Germany, Oct. 19, 1971, 2151958The portion of the term of this patent subsequent to Aug. 26, 1992, has been disclaimed.

Int. Cl.[2] B01J *23/10*

U.S. Cl. 252—462 8 Claims

1. Catalyst having the formula:

$$(A_1)_m\,(B_1)_p\,(B_2)_q\,O_3$$

wherein

m is 1, and p and q, respectively, have values greater than 0 but less than 1, and $p+q=1$; and

A_1 is at least one trivalent cation of metals selected from the group consisting of Bi and the rare earth metals;

B_1 is at least one divalent cation of metals selected from the group consisting of Ni, Co, Fe and Cu;

B_2 is at least one tetravalent cation of metals selected from the group consisting of Ru, Os, Ir, Pt, Ti, Mo, Mn and V; with the proviso that when B_1 is Cu, B_2 is only Mn, and the further proviso that $(m\,.\,a_1)+(p\,.\,b_1)+(q\,.\,b_2)$ equals 6 such that a neutrality of charge exists, wherein

a_1= the valency of A_1

b_1= the valency of B_1 and

b_2= the valency of B_2.

3,900,429

CATALYST FOR PURIFYING EXHAUST GASES

Noboru Komatsu, Toyoake; Osami Kamigaito; Takatoshi Suzuki; Haruo Doi; Kazuya Sano; Nobuyuki Yamamoto; Toshio Kandori, and Yukikazu Tsuzuki, all of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, Japan

Filed Feb. 6, 1974, Ser. No. 440,021

Claims priority, application Japan, Feb. 14, 1973, 48-18112

Int. Cl. B01j *11/06, 11/22*

U.S. Cl. 252—462 18 Claims

1. A catalyst for purifying exhaust gases produced by a process, which comprises the steps of:

mixing particles of nickel and copper; nickel, copper and chromium or nickel; copper, chromium and an oxide selected from the group consisting of yttrium oxide, titanium oxide, lanthanum oxide and mixtures thereof;

sintering said particles at a temperature ranging from 500° to 1000°C in air or an oxygen containing gas which results in partial oxidation of the particles; and

activating said sintered mixture at a temperature ranging from 500° to 1000°C under an atmosphere of a reductive gas or a non-oxidizing gas.

3,900,430

CATALYTIC HYDROCARBON CONVERSION PROCESS

William Ralph Beaty, Jr., Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed May 14, 1973, Ser. No. 360,274

Int. Cl. B01j *23/08*

U.S. Cl. 252—463 7 Claims

1. A hydrodesulfurization catalyst consisting essentially of from about 0.5 to about 25 weight percent based on the catalyst weight of at least one catalytic metal selected from the group consisting of molybdenum, tungsten, chromium, nickel and cobalt supported on gamma alumina produced by a process consisting essentially of

a. hydrolyzing aluminum alkoxides to produce an aqueous alumina portion containing up to about 32 weight percent Al_2O_3 and an organic reaction product;

b. contacting said aqueous alumina slurry with an organic solvent selected from the group consisting of ethanol, propanol, isopropanol, butanol, hexanol, isobutanol and tertiary butanol in an amount sufficient to produce alumina having a cumulative pore volume (0–10,000A) from about 1.0 to about 2.75 cc/g, a surface area from about 225 to about 400 m^2/g and a loose bulk density from about 7.5 to about 25 lb/ft^3 upon drying to an Al_2O_3 content from about 80 to about 100 weight percent to form a solvent-aqueous alumina mixture;

c. drying said solvent-aqueous alumina mixture to produce alumina; and

d. forming said alumina of (c) into particles and calcining to produce said gamma alumina.

3,900,431

PHOTOCONDUCTIVE MATERIAL COMPRISING A SOLID SOLUTION OF (Cd, Pb)S

Toshio Kobayashi, Kokubunji; Kenzo Susa, Hachioji, and Satoshi Taniguchi, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 8, 1974, Ser. No. 459,182

Claims priority, application Japan, Apr. 11, 1973, 48-40445

Int. Cl.[2] H01L *31/18*

U.S. Cl. 252—501 13 Claims

1. A photoconductive material comprising a solid solution represented by the general formula (Cd, Pb)S and which has a rock-salt type crystal structure.

7. A process for making a photoconductive material composed of a solid solution represented by the general formula (Cd,Pb)S and which has a rock-salt type crystal structure, said process comprising maintaining the temperature of a mixture of powdery cadmium sulfide and powdery lead sulfide at at least about 600°C for a period of time and under a pressure sufficient so that the calcium sulfide and lead sulfide form a solid solution having a rock-salt type crystal structure.

3,900,432

VARISTOR COMPOSITIONS

Sanford Morton Marcus, and Frank Knowles Patterson, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 15, 1973, Ser. No. 406,302

Int. Cl. H01b *1/06*

U.S. Cl. 252—519 30 Claims

1. A composition useful for printing a film on a dielectric substrate and firing the same to form film varistors, said composition being of finely divided inorganic material dispersed in an inert liquid vehicle, said inorganic material comprising, by weight,

a. 60–99% of a crystalline semiconductive oxide of the formula $Fe_{2-x}M_xO_3$, wherein M is one or more of Ge and Ti and x is in the range 0.0001–0.05, and

b. 1–40% of a glass powder comprising one or more of at least 10% PbO, at least 10% Bi_2O_3 and at least 25% CdO.

3,900,433

EXPANDABLE POLYSTYRENE BEADS

Bernard Taub, Williamsville, and Daniel F. Harnish, Orchard Park, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 17, 1973, Ser. No. 425,372
Int. Cl. G08j *1/26*
U.S. Cl. 260—2.5 B 16 Claims

1. A process for making expandable styrene polymer particles by contacting particles of said styrene polymer with a volatile organic fluid blowing agent, said blowing agent containing from about 0.5 to about 20 percent by weight of blowing agent of an impregnation aid consisting essentially of a compound having a solubility parameter between 7 and 12 hildebrands, a critical volume of less than about 190 cm^3/gram mole and a hydrogen bonding parameter contribution to said solubility parameter of less than 5 hildebrands, the impregnation aid being present in an amount sufficient to permit incorporation of the blowing agent into the styrene polymer particle to form a free flowing styrene polymer particle.

3,900,434

WALLBOARD TAPE JOINT COMPOSITION AND ADHESIVE THEREFOR CONTAINING WATER SOLUBLE POLYACRYLAMIDE, LIMESTONE, ASBESTOS, MICA AND CELLULOSE ETHER

Fabio B. Bruschtein, and Dennis L. Lyftgot, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 4, 1973, Ser. No. 393,854. The portion of the term of this patent subsequent to Feb. 19, 1991 has been disclaimed.
Int. Cl. C08b *21/32*
U.S. Cl. 260—17 R 7 Claims

1. In a dry powder composition suitable on admixture with water for adhering and covering wallboard joint tapes which comprises a major proportion of up to about 88 percent by weight of minus 100 mesh ground limestone, from about 2 to about 20 percent by weight of asbestos, from about 5 to about 20 percent by weight of minus 100 mesh mica, from about 0.25 to about 1 percent by weight of water-soluble cellulose ether and from about 1.5 to about 5 percent by weight of a water-soluble polyacrylamide, said polyacrylamide having a low degree of hydrolysis of from 0 to about 5 percent, the improvement which consists in employing a polyacrylamide characterized by (1) an Ostwald viscosity of at least 2.4 centipoises for a 0.5 percent by weight solution thereof in distilled water and (2) a Brookfield viscosity of no greater than 700 centipoises for a 5.1 percent by weight solution thereof in aqueous 1 percent borax solution, said polyacrylamide being in the form of finely divided solids having a particle size such that substantially 100 percent thereof passes through a screen having 35 meshes to the inch.

3,900,435

PULVERULENT ACRYLIC RESIN BINDER MIXTURES CONTAINING TRIGLYCIDYL ISOCYANURATE AND CELLULOSE ACETOBUTYRATE

Frank Wingler, Leverkusen, and Richard Muller, Bergisch-Neukirchen, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Apr. 2, 1974, Ser. No. 457,258
Claims priority, application Germany, Apr. 7, 1973, 2317578
Int. Cl. B05b *5/02*; C08b *21/08*
U.S. Cl. 260—17 4 Claims

1. A powdered coating agent comprising a mixture of
A. a copolymer of
I. 23 to 92% by weight of methyl methacrylate,
II. 5 to 62% by weight of an acrylic acid ester having from 1 to 12 carbon atoms in the ester portion or a methacrylic acid ester having from 2 to 12 carbon atoms in the ester portion or a mixture thereof and
III. 3 to 15% by weight of acrylic acid, methacrylic acid, itaconic acid, maleic acid or fumaric acid or a mixture thereof,
wherein the sum of the percentage contents of I to III is 100 and the average molecular weight is from about 3,000 to 20,000,
B. triglycidyl isocyanurate and
C. cellulose acetobutyrate
wherein there are 95 to 80 parts by weight of said copolymer (A) to 5 to 20 parts by weight of triglycidyl isocyanurate (B) and 50 to 40% by weight, based on (A), of cellulose acetobutyrate (C).

3,900,436

POLYESTERAMIDE RESIN

Manfred Drawert, Werne; Eugen Griebsch, Unna; Bernhard Krieger, Bergkamen; Horst Schepp, Altluenen, and Christian Burba, Luenen, all of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Aug. 30, 1972, Ser. No. 260,800
Claims priority, application Germany, June 11, 1971, 2128984
Int. Cl. C08g *20/30*
U.S. Cl. 260—18 N 2 Claims

1. A polyesteramide resin having an hydroxy number between 9.35 and 37.1, said resin comprising
1. an acid component comprising
A. 85 to 95 percent by weight of a polymerized C_8–C_{24} fatty acid product containing from 5 to 15 percent by weight of monomeric fatty acid, 60 to 80 percent of dimeric fatty acid, and 10 to 35 percent by weight of trimeric and higher fatty acid polymers, and
B. 15 to 5 percent by weight of an additional monomeric C_{16}–C_{18} fatty acid;
and condensed therewith in a substantially equivalent amount,
2. a second component comprising
A. from 5 to 20 equivalent percent of an aliphatic polyol having at least three primary or secondary hydroxy groups and
B. 95 to 80 percent of ethylene diamine,
said resin additionally comprising an excess of 5 to 20 equivalent percent of hydroxy component condensed with said acid component.

3,900,437

NEW METHOD FOR THE PREPARATION OF POLYAMIDE ADDUCT

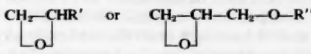
Harold M. Preston, Minneapolis, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 320,407, Jan. 2, 1973, abandoned. This application July 1, 1974, Ser. No. 484,721
Int. Cl. C08 *30/00*
U.S. Cl. 260—18 PN 1 Claim

1. A process comprising: heating a mixture of
a. an amine component having the formula

$$H_2N—[R—NH]_x—H$$

wherein R is an aromatic group containing 6 to 10 carbon atoms or an alkylene containing 2 to 4 carbon atoms and x is an integer from 1 to 5,
b. a monoepoxide component selected from monoepoxides having the formula



wherein R′ is a hydrogen group, phenyl group, alkyl group having from 1 to 10 carbon atoms, or an alkylene carboxylate group having 2 to 22 carbon atoms and R″ is a phenyl group or an alkyl group having from 1 to 10 carbon atoms, and

c. an acid component selected from monomeric, aliphatic, unsaturated monocarboxylic fatty acids containing 16 to 22 carbon atoms or polymeric fat acids predominantly containing 32 to 44 carbon atoms;

wherein said mixture comprises about 0.3 to 93.5 equivalent percent epoxide component, about 2.8 to 99 equivalent percent amine component and about 0.5 to 89.0 equivalent percent acid component;

said heating increasing the temperature of the above mixture from a temperature below the boiling point of the epoxide component to a temperature of about 350°F. to 450°F. and conducted so that the temperature of the above mixture is held below the boiling point of the epoxide component, the boiling point of said epoxide component being adjusted in the mixture by adjusting the pressure under which the reaction is conducted, for a period of time sufficient to permit association of the monoepoxide component and the amine component prior to heating to the temperature of about 350°F. to 450°F. and holding at that temperature for a time period of about three to eight hours until the amidification reaction takes place thereby forming a polyamide resin-epoxide adduct wherein the amine component is condensed with the monoepoxide.

3,900,438
COPOLYMER-WAX COMPOSITION

Richard E. Zdanowski, Fort Washington, and Bjorn E. Larsson, Rushland, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 353,585, March 20, 1964, abandoned, which is a continuation-in-part of Ser. No. 74,230, Dec. 7, 1960, abandoned. This application Feb. 12, 1970, Ser. No. 11,017

Int. Cl. C08f *45/24, 45/52;* **C09g** *1/10*

U.S. Cl. 260—28.5 R **28 Claims**

1. An emulsion of copolymeric resin particles dispersed in water containing a dispersing agent, said particles being an emulsion copolymer selected from those prepared from:

a)	ethyl acrylate	60%
	methyl methacrylate	30%
	t-butylaminoethyl methacrylate	10%,
b)	ethyl acrylate	25%
	methyl methacrylate	71%
	dimethylaminoethyl methacrylate	4%,
c)	ethyl acrylate	45%
	methyl methacrylate	45%
	dimethylaminoethyl methacrylate	10%,
d)	ethyl acrylate	70%
	methyl methacrylate	20%
	dimethylaminoethyl methacrylate	10%,

the percentages being weight percentages, said copolymer when admixed with wax being redispersible in acid solution but not redispersible in neutral or alkaline solution, the amount of wax being 5 to 50 parts per 50 to 95 parts of copolymer by weight, said wax being selected from montan, carnauba, Chinese insect, ceresin, ozocerite, polyethylene, and microcrystalline waxes.

3,900,439
METHOD AND COMPOSITION FOR REPAIRING ASPHALT PAVEMENT

Carl Joseph Kay, Burbank, Calif., assignor to Products Research & Chemical Corporation, Burbank, Calif.

Filed May 24, 1974, Ser. No. 473,136

Int. Cl. C08f *45/52*

U.S. Cl. 260—28.5 AS **18 Claims**

1. Method for repairing asphalt pavement having voids on the top surface thereof which comprises:

forming a uniform admixture of (a) aggregate granules the surfaces of which are substantially completeiy coated with a coating composition consisting essentially of a mixture of asphalt and ethylene-vinylacetate copolymer and (b) between 0.5 to 5 percent, by weight, of a solvent solution consisting essentially of an organic solvent for the coating composition which will tackify and solvate said coating composition said organic solvent having a solubility parameter from about 7 to 10, a boiling point from about 150°F. to about 325°F. and an evaporation rate of from about 0.1 to 6.0, at room temperature, using butyl acetate as 1.0 as the basis; and from 0 to 50 percent, by weight, of a binder which is a mixture of asphalt and ethylene-vinylacetate copolymer;

and filling said voids with said admixture and compacting the same in said voids to form a long lasting patch which can be driven upon by vehicular traffic shortly after filling said voids.

3,900,440
ADHESIVE COMPOSITION

Osamu Ohara, and Nobuyoshi Wakabayashi, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Oct. 23, 1973, Ser. No. 408,882

Claims priority, application Japan, Nov. 2, 1972, 47-110048

Int. Cl. C08d *7/14;* **C08f** *15/40, 45/26, 45/58*

U.S. Cl. 260—29.7 W **27 Claims**

1. An adhesive composition comprising: (A) an aqueous solution of a member selected from the group consisting of (1) a copolymer of an α-olefin having from 2 to 8 carbon atoms and at least one comonomer selected from the group of an unsaturated carboxylic acid, an ester of an unsaturated carboxylic acid and a compound having a functional group which is convertible to a carboxyl group by hydrolysis or alkali saponification, said comonomer being present in an amount comprising from 30 to 85% by weight of the copolymer, the degree of polymerization being at least 100, and (2) a water soluble salt of said copolymer; (B) a salt selected from the group consisting of the carbonate, sulfate, nitrate, acetate, phosphate, chloride and silicate salts of calcium, magnesium, zinc, barium, cadmium, lead, copper, aluminum, iron, nickel and cobalt, in an amount less than 8000% by weight of the copolymer; and (C) a compound having at least two epoxy groups per molecule in an amount less than 1000 mole % based on the carboxyl group of the copolymer.

3,900,441
ZINC AND MOLYBDENUM-CONTAINING COMPOUNDS AS SMOKE DEPRESSANTS FOR POLY(VINYL CHLORIDE) RESIN COMPOSITIONS

Thomas Y. King, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Continuation-in-part of Ser. No. 340,271, March 12, 1973, abandoned. This application July 10, 1974, Ser. No. 487,175

Int. Cl. C08f *45/56, 45/62*

U.S. Cl. 260—31.8 HA **9 Claims**

1. A poly(vinyl chloride) homopolymer or copolymer resinous composition, wherein said copolymer comprises a major portion of vinyl chloride, containing, as a smoke suppressant, based on 100 parts by weight resin:

a. a mixture of zinc and molybdenum compounds containing between about 0.2 to 7.0 parts by weight zinc metal

from zinc compounds selected from the group consisting of inorganic zinc compounds and zinc 2-ethylhexonate and between about 0.3 to 10.0 parts by weight molybdenum metal from molybdenum compounds having the molybdenum ion in the six plus valence state and selected from the group consisting of inorganic molybdenum compounds and molybdenyl acetyl acetonate, the total zinc to molybdenum metal weight ratio being less than about 2:1 with the total weight of the metal ions in said mixture being between about 0.8 parts and 10 parts by weight; or b. 0.5 to 7 parts by weight zinc molybdate.

3,900,442
TITANIUM DIOXIDE PIGMENTED POLYMER COMPOSITIONS WITH IMPROVED VISIBLE AND ULTRAVIOLET LIGHT STABILITY

Joseph S. Zannucci, and Gerald R. Lappin, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

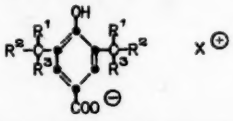
Continuation of Ser. No. 394,369, Sept. 4, 1973, abandoned. This application Apr. 30, 1974, Ser. No. 465,470

Int. Cl.[2] C08K *5/13, 5/27*

U.S. Cl. 260—42.46 **9 Claims**

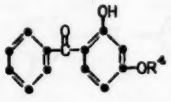
1. Composition comprising a titanium dioxide pigmented polymer normally susceptible to degradation due to visible or ultraviolet light selected from the group consisting of poly-α-olefins prepared from at least one α-monoolefin having 2 to 12 carbon atoms and graft copolymers prepared by polymerizing an α- monoolefin containing 2 to 5 carbon atoms and subsequently grafting maleic or acrylic acid to the polymer backbone; mixed with a stabilizing amount of the following components (1) and (2):

1. a compound having the formula

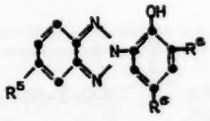


wherein R^1 to R^3 are the same or different and each represents an alkyl group having 1 to 8 carbon atoms; X^+ is Mn^{+2}or Zn^{+2}; and

2. a compound selected from (a) compounds having the formula:



or (b) compounds of the formula:



wherein R^4 represents hydrogen or alkyl, R^5 represents hydrogen or chloro, each R^6 is the same or different and represents hydrogen or alkyl, each of said components being utilized in an amount of from about 0.01 to about 4.0 weight percent based on the weight of the polymer with an upper limit such that the sum of all such percentages of said components does not exceed 5 weight percent based on the weight of the polymer.

3,900,443
TRIAZINE DERIVATIVES

Christian Luethi, Muenchenstein; Hans Rudolf Biland, Gelterkinden, and Max Duennenberger, Frenkendorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

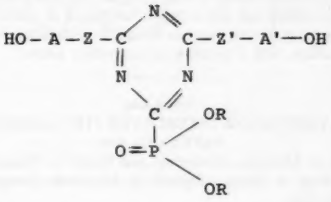
Division of Ser. No. 156,541, June 24, 1971, abandoned. This application Nov. 14, 1973, Ser. No. 415,715

Claims priority, application Switzerland, June 30, 1970, 9877/70

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.8 NT **10 Claims**

1. A composition of matter consisting essentially of an organic material subject to oxidative decomposition and from 0.01 to 5% by weight of the organic material of a stabilizer having the formula



wherein A and A′ are identical or different and represent an unsubstituted or substituted phenylene radical which is bound in position 1 to Z or Z′ and carries in position 4 a hydroxyl group; Z and Z′ are identical or different and represent a bridging member —O—, —S— or —NQ—, with Q standing for hydrogen, alkyl, alkoxy, or —CN; R and R′ are identical or different and represent an unsubstituted or substituted alkyl, cycloalkyl or phenyl radical.

3,900,444
FLAME RESISTANT THERMOPLASTIC POLYESTERS

Werner Racky, Wiesbaden; Hans-Jerg Kleiner, Bad Soden, Taunus, and Walter Herwig, Neuenhain, Taunus, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

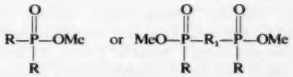
Filed Oct. 23, 1973, Ser. No. 408,644

Claims priority, application Germany, Oct. 25, 1972, 2252258

Int. Cl.[2] C08G *51/62*

U.S. Cl. 260—45.75 P **6 Claims**

1. A flame resisting thermoplastic polyester consisting essentially of a polyalkylene terephthalate which may contain up to 10 mole % based on the total dicarboxylic acid and diol units in said polyester of units derived from a dicarboxylic acid other than terephthalic acid and up to 10 mole % of units derived from a diol other than an alkylene diol, containing an effective flame-retarding amount of a flame-retarding compound of the formula



wherein Me represents an alkali metal, R represents the same or different alkyl radicals of 1 to 6 carbon atoms, and R_1 represents an alkylene radical of 2 to 4 carbon atoms.

3,900,445
PROCESS FOR THE PREPARATION OF POLYPHENYLENE ETHERS WITH CUPROUS AND CUPRIC AMINE CATALYST

Glenn D. Cooper, and James G. Bennett, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 26, 1973, Ser. No. 428,449
Int. Cl.[2] C08G *65/44*
U.S. Cl. 260—47 ET **12 Claims**

1. In a process for the preparation of a high molecular weight polyphenylene ether having a degree of polymerization of at least 50 by oxidatively coupling a monovalent phenol having substitution in at least the two ortho positions and hydrogen or halogen in the para position, using oxygen and a complex catalyst as an oxidizing agent, the improvement which comprises using as said complex catalyst a mixture of a cuprous halide salt and a cupric halide salt at a ratio of from 0.1:1 to 1:0.1 of said cuprous halide to said cupric halide, in combination, with a primary, or secondary amine.

3,900,446
POLYURETHANE INTERLAYER FOR LAMINATED SAFETY GLASS

Charles E. McClung, Kettering, and David G. Glasgow, Dayton, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 313,492, Dec. 8, 1972, Pat. No. 3,823,060, which is a continuation-in-part of Ser. No. 219,175, Jan. 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 58,731, July 27, 1970, abandoned. This application Sept. 27, 1973, Ser. No. 401,481
Int. Cl.[2] C08G *22/06, 22/10, 22/24*
U.S. Cl. 260—75 NT **10 Claims**

1. A polyurethane interlayer for laminated safety glass consisting essentially of the polymerization reaction product of (1) a diisocyanate which is an isomeric mixture of 4,4′-methylenebis(cyclohexylisocyanate); (2) a hydroxy terminated polyester having a melting point above 42°C. and a molecular weight in the range of from 800 to 1200 which is selected from the group consisting of poly(1,4-butylene adipate) and poly(ethylene adipate); and (3) a chain extender which is a diol-containing from 2 to 16 carbon atoms; which is selected from the group consisting of aliphatic and alicyclic diols; wherein the diisocyanate isomeric mixture has a trans-trans content of from 0 to 30 percent by weight, a cis-cis content of from 0 to 25 percent by weight and a cis-trans content of from 45 to 90 percent by weight and wherein the ratio of diisocyanate/polyester/chain extender in the polyurethane interlayer is in the range of from 1.5/1.0/0.5 to 4/1.0/3.0.

3,900,447
THERMALLY ACTIVATED PROMOTERS FOR SALT COMPLEX CURING AGENTS

Norman Martin van Gulick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 30, 1974, Ser. No. 465,698
Int. Cl.[2] C08G *18/32, 18/38*
U.S. Cl. 260—77.5 AM **15 Claims**

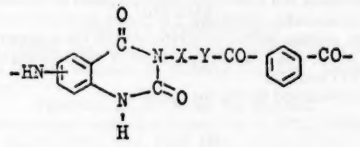
1. In a process wherein a urethane prepolymer containing free isocyanato groups is heated in contact with a complex of 4,4′-methylenedianiline and a salt to a temperature sufficient to cure the prepolymer, the salt component of the complex being selected from the group consisting of sodium chloride, sodium bromide, sodium iodide, sodium nitrite, lithium chloride, lithium bromide, lithium iodide, lithium nitrite, and sodium cyanide, the ratio of said 4,4′-methylenedianiline to salt in said complex being 3 moles to 1 mole, the improvement comprising employing the aforesaid complex in a mixture with a urea channel inclusion complex, the latter being employed in an amount of about 0.1–10% by weight of the total weight of the prepolymer and both complexes, and heating the resulting dispersion of prepolymer and both complexes to a curing temperature of about 60°–140°C., whereby the urea channel inclusion complex is decomposed.

3,900,448
COPOLYAMIDES WHICH CONTAIN QUINAZOLINEDIONE STRUCTURES

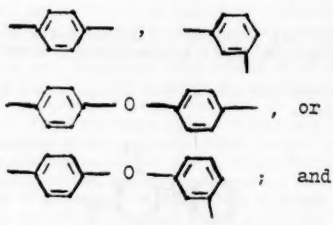
Gerhard Dieter Wolf, Dormagen, and Francis Bentz, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 30, 1973, Ser. No. 420,372
Claims priority, application Germany, Dec. 2, 1972, 2259123
Int. Cl. C08g *20/20, 20/22*
U.S. Cl. 260—78 R **3 Claims**

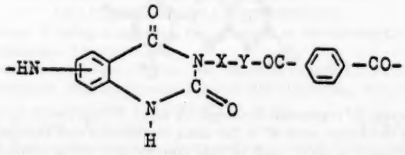
1. High molecular weight aromatic copolyamides which contain quinazolinedione structures comprising 25 to 99 mols-% of structural units of the formula



in which
X is



Y is — NH —;
and the remaining 75 to 1 mols-% of structural units of the general formula



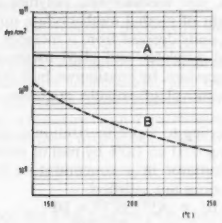
in which X and Y have the meanings defined above, said copolyamides having a relative viscosity (η rel. determined on a 0.5% solution of the copolyamide in sulphuric acid at 25°C) of 1.3 to 4.5.

3,900,449

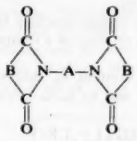
STORAGE-STABLE AND THERMOSETTING MIXTURES

Heinz Rembold, Arlesheim; Theobald Haug, Frenkendorf; Sigfried Wyler, Dornach, and Jurg Kiefer, Reinach, all of Switzerland. assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 14, 1973, Ser. No. 370,179
Claims priority, application Switzerland, July 4, 1972, 9991/72
Int. Cl. C08f *17/00*
U.S. Cl. 260—78 UA 8 Claims

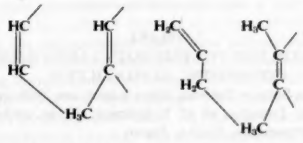


1. Storage-stable, thermosetting mixtures which are characterised in that they contain (a) N,N′-bis-imides of unsaturated dicarboxylic acids of the general formula

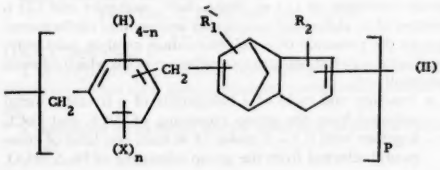


(I)

in which A denotes a divalent organic radical with at least 2 and at most 30 carbon atoms and B denotes a radical of the formulae

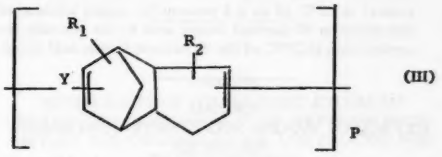


and (b) dimeric or oligomeric halogen-containing bis-(cyclopentadienyl), compounds of the general formula



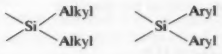
(II)

in which X denotes a fluorine, chlorine or bromine atom, R_1 and R_2 each denote a hydrogen atom or a methyl group, n denotes an integer having a value of at least 1 and at most 4 and P denotes a number having a value of 2 to 20, it being optionally possible for component (b) to be replaced, to the extent of up to 50 mol per cent by bis-(cyclopentadienyl) compounds of the formula III



(III)

in which Y denotes a radical of the formulae



or a divalent aliphatic, cycloaliphatic, araliphatic or aromatic hydrocarbon radical, the molar ratio of N,N′-bis-imides of formula I to the bis-(cyclopentadienyl) compounds of formula II and optionally III being about 1:4 to 4:1.

3,900,450

PREPARATION OF POLYAMIDES BY CONTINUOUS POLYMERIZATION

Iqbalsingh Jaswal, Copper Cliff, and Kalev Pugi, Kingston, both of Canada, assignors to Du Pont of Canada, Ltd., Montreal, Canada

Filed Aug. 29, 1973, Ser. No. 392,511
Claims priority, application Canada, Mar. 5, 1973, 165282
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 R 21 Claims

1. A process for the continuous preparation of an aliphatic polycarbonamide from an aliphatic polycarbonamide-forming aqueous salt solution prepared from a diamine and a dicarboxylic acid comprising:

injecting continuously an aliphatic polycarbonamide-forming aqueous salt solution into a first reaction zone designed to permit rapid heating and uniform mixing;

heating and uniformly mixing the salt solution within the first reaction zone at amide-forming pressures, temperatures and hold-up times to form a first vapor and a prepolymer having an extent of reaction in the range of from 70 to 98 percent and a relative viscosity in the range of from about 2.3 to about 11, said mixing being accomplished by recirculating a portion of said prepolymer past the location of said injecting step and injecting said reactants into said portion of prepolymer being recirculated;

continuously separating the first vapor from the prepolymer so formed;

passing the prepolymer from the first reaction zone into a second reaction zone;

heating the prepolymer for a predetermined hold-up time within the second reaction zone to form a second vapor and a polymer having an extent of reaction in the range of about 96.5 to 99 percent and a relative viscosity in the range of from about 6 to about 26;

continuously separating the second vapor from the polymer so formed; and

withdrawing the polymer from the second reaction zone, relative viscosity being the ratio of viscosity (in centipoises) at 25°C. of an 8.4 percent by weight solution of polyamide in 90 percent formic acid to the viscosity (in centipoises) at 25°C. of the 90 percent formic acid alone.

3,900,451

METHOD OF MAKING SULFHYDRYL-CONTAINING POLYMERS

Albertha B. Mitchell, Framingham; Suzanne V. McKinley, Wellesley, both of Mass., and Joseph W. Rakshys, Jr., Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 24, 1973, Ser. No. 391,429

Int. Cl. C08f *27/06*

U.S. Cl. 260—79.5 NV **6 Claims**

1. A process for preparing sulfhydryl-containing polymers comprising reacting by contacting

a. a chloromethylated vinylaromatic polymer whose backbone comprises units of the formula

$$+CH_2-CH+$$

$$C_6H_4-CH_2-Cl,$$

said polymer being swollen or dissolved in an inert water-immiscible organic solvent, and

b. an aqueous solution of an alkali metal hydrosulfide, in the presence of

c. a catalytic amount of an organic onium salt.

3,900,452

OLEFINIC COPOLYMERS AND PROCESS FOR THE PREPARATION THEREOF

Alberto Valvassori, Milan, Italy; Guido Sartori, Brussels, Belgium, and Vittorio Turba, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Continuation-in-part of Ser. Nos. 373,064, June 5, 1964, abandoned, and Ser. No. 515,482, Dec. 21, 1965. This application Jan. 17, 1969, Ser. No. 797,337

Claims priority, application Italy, June 7, 1963, 12064/63; Nov. 12, 1963, 23100/63

Int. Cl. C08f *15/14, 15/40*

U.S. Cl. 260—80.78 **24 Claims**

1. Substantially linear, amorphous, unsaturated high molecular weight copolymers of at least one monoolefin having the formula $CH_2 = CHR$ in which R is selected from the group consisting of hydrogen and alkyl groups containing from 1 to 6 carbon atoms, and at least one triene selected from the group consisting of 1,4,9-decatriene; alkyl-substituted 1,4,9-decatriene, aryl-substituted 1,4,9-dectriene; arylalkyl-substituted 1,4,9-decatriene; and 1,5,9-decatriene, said copolymers containing ethylene in an amount less than about 75% by mols and such that the copolymer is amorphous on X-ray examination, between 0.1% and 30% by mols of the triene, and the balance, if any, being a higher alpha-olefin of the formula $CH_2 = CHR$ in which R is an alkyl group containing from 1 to 6 carbon atoms, and consisting of macromolecules containing unsaturations and each of which is made up of units derived from all of the starting monomers, and said copolymers being further characterized in that each of the units derived from the triene contains at least one free double bond.

3,900,453

PROCESS FOR THE PRODUCTION OF METHACRYLATE POLYMER MOLDING MATERIALS

Kazushi Shimada; Toru Maeda; Tamotu Nishizawa; Takehiko Narisada; Hisao Anzai, all of Otake, and Yositaka Sasaki, Tokyo, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Aug. 15, 1973, Ser. No. 388,554

Claims priority, application Japan, Aug. 15, 1972, 47-81138; July 18, 1973, 48-80306

Int. Cl. C08f *3/68, 15/18*

U.S. Cl. 260—86.1 E **7 Claims**

1. A process for the production of methacrylate polymer molding materials, said methacrylate polymer containing at least 80% by weight of methyl methacrylate units and up to 20% by weight of units derived from a member of the group consisting of alkyl acrylates and alkyl methacrylates other than methyl methacrylate, by continuous bulk polymerization and subsequent removal of volatile contents, said process comprising:

continuously feeding to a polymerization zone a monomer feed containing 0.01 to 1.0% by mol of mercaptan and a free radical initiator in a concentration such that the following relations are satisfied:

$$10 \geq A^{1/2} \cdot B^{-1/2} \times 10^3,$$

$$3 \geq A \cdot B \times 10^5,$$

and

$$2.9 \geq A^{-1}(B + 10.3) \times 10^{-6}$$

where A = concentration of the free radical initiator in the monomer feed in terms of the number of moles of the initiator per 100 g of the monomer feed, and

B = half-life in hour of the free radical initiator at a temperature of polymerization;

thoroughly stirring the resultant reaction mixture;

maintaining the reaction mixture at a temperature of above 130° and 160°C;

maintaining a polymer content in said reaction mixture substantially constant and so as to satisfy the following relation:

$50 < \phi < 70 \exp(0.0121T - 1.81)$

where ϕ = the polymer content in said reaction mixture in % by weight, and

T = polymerization temperature in °C, whereby polymerization is effected:

continuously withdrawing the reaction mixture from the polymerization zone and

continuously removing volatile contents of said withdrawn reaction mixture.

3,900,454

METHOD FOR POLYMERIZING MONOMERS COMPRISING ALPHA-OLEFIN

Akihiro Sato; Saburo Takeda; Shiro Konotsune; Mitsuru Kato, and Takao Tonoike, all of Yokohama, Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 23,484, March 7, 1970, abandoned, which is a continuation-in-part of Ser. No. 794,421, Jan. 27, 1969, abandoned. This application Nov. 9, 1972, Ser. No. 305,045

Claims priority, application Japan, Feb. 3, 1968, 43-6546; July 9, 1968, 43-47974

Int. Cl. C08f *1/56;* **B01j** *11/84*

U.S. Cl. 260—88.2 R **7 Claims**

1. A method for polymerizing a material selected from the group consisting of (1) an alpha-olefin monomer and (2) a mixture of an alpha-olefin monomer and another olefin monomer in the presence of a polymerization catalyst, said polymerization catalyst being prepared by a process which consists essentially of;

a. reacting one mole of a halogenide of a trivalent metal selected from the group consisting of $AlCl_3$ and $FeCl_3$ together with 0.1 – 2 moles of at least one kind of compound selected from the group consisting of $Na_2S.9H_2O$,

$LiOH.H_2O$, $Mg(OH)_2$, $Zn(OH)_2$, $Ca(OH)_2$, $MgCl_2.6H_2O$, $SnCl_2.2H_2O$, $TiCl_3.6H_2O$, $MnCl_2.4H_2O$, $FeCl_2.2H_2O$, $CoCl_2.6H_2O$, $NiCl_2.6H_2O$, $Cr(OH)_3$, $Mn(OH)_2$, $Fe(OH)_3$, $Co(OH)_3$, $Ni(OH)_2.H_2O$, $VOSO_4.2H_2O$, $CoSO_4.7H_2O$ and $FeSO_4.7H_2O$ so as to form a first reaction product having active groups on the surface,

b. the reaction of step (a) being carried out at a temperature ranging from 60° to 200°C under an atmospheric or reduced pressure,

c. reacting the product resulting from step (a) with a compound of transition metal selected from the group consisting of halides, oxyhalides, alcoholates, alkoxyhalides and acetoxyhalides of titanium, vanadium and chromium,

d. the reaction of step (c) being carried out in an inert hydrocarbon solvent

e. combining the reaction product of step (c) with an organoaluminum compound selected from the group consisting of trialkylaluminum, alkylaluminum, sesquihalide, dialkylaluminum monohalide, and monoalkylaluminum dihalide at a temperature of about −50°C to about 150°C and under a pressure from the atmospheric pressure to 40 kg/cm² in an inert hydrocarbon solvent.

3,900,455
PROCESS TO EMULSION POLYMERIZE VINYL CHLORIDE

Paul Kraft, So. Spring Valley, and Jung Il Jin, Irvington, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 16, 1974, Ser. No. 498,488
Int. Cl. C08f *3/30*
U.S. Cl. 260—92.8 W **10 Claims**

1. In an emulsion polymerization of vinyl chloride monomer in the presence of an emulsifier wherein the improvement comprises conducting said polymerization in a polymerization medium comprising a sodium alkyl sulfosuccinate emulsifier and in ammonium or alkali metal borate.

3,900,456
POLYISOPRENE

Floyd E. Naylor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 31, 1974, Ser. No. 438,421
Int. Cl. C08d *1/4, 3/2*
U.S. Cl. 260—94.3 **24 Claims**

1. A process which comprises polymerizing isoprene under polymerization conditions including effective polymerization temperature, pressure, and time, to form a high cis rubbery polymer having a cis 1,4 content of at least about 83 percent wherein the improvement comprises polymerization in the presence of an effective amount of the catalyst which forms on admixing components consisting essentially of effective catalytic ratios of (I) a hydrocarbon compound of a metal of Group IA of the periodic table, (II) an aluminum halide, and (III) a tetravalent titanium salt represented by TiY_4 wherein Y is chlorine, bromine, iodine, or alkoxylic —OR, wherein R is a hydrocarbon radical containing up to 8 carbon atoms per R group.

3,900,457
OLEFIN POLYMERIZATION CATALYST

Donald R. Witt, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 8, 1970, Ser. No. 79,316
Int. Cl. C08f *1/66, 3/06*
U.S. Cl. 260—94.9 D **4 Claims**

1. A polymerization catalyst comprising an oxide of chromium supported on a silica-containing composition prepared by:

a. adding an alkali metal silicate to an acid to form a hydrogel;

b. aging the hydrogel;

c. washing the aged hydrogel to produce a substantially alkali metal-free hydrogel;

d. forming a mixture comprising the washed hydrogel and a normally liquid oxygen-containing water-soluble organic compound;

e. separating said organic compound and water from said mixture to form a xerogel; and

f. recovering said xerogel as said silica-containing composition.

3,900,458
MIXED SALTS OF POLSULFURIC ESTERS OF NATURALLY OCCURRING GLYCOPEPTIDES WITH METALS AND ORGANIC BASES, AND PROCESS FOR PRODUCING SAME

Adriano Butti, Como, and Giuseppe Prino, Milan, both of Italy, assignors to Crinos Industria Farmacobiologica S.p.A., Villa Guardia, Italy

Filed Mar. 22, 1974, Ser. No. 453,765
Claims priority, application Italy, Mar. 27, 1973, 22122/73
Int. Cl.² C07G *7/04*
U.S. Cl. 260—112 R **20 Claims**

1. A process for the preparation of a mixed salt, wherein the anionic moiety is a sulfoglycopeptide polyanion and the cationic moiety is:

a. a metal cation selected from the group consisting of the alkali metal and alkaline-earth metal cations; and

b. a nitrogen-containing organic cation which is the cation of an organic base having spasmolytic and anticholinergic activities;

which process comprises:

1. mixing a solution of a sulfoglycopeptide in its acid form with a solution of an alkali metal or alkaline-earth metal salt of a sulfoglycopeptide;

2. mixing the solution thus obtained with a solution of a nitrogen-containing organic base, having spasmolytic and anti-cholinergic activity, in a solvent, to salify said acid sulfoglycopeptide, thus obtaining a solution of the mixed salt; and

3. separating the mixed salt from the solvent.

3,900,459
PROCESS FOR PREPARING HIGH MOLECULAR WEIGHT AZO PIGMENT

Kimihide Kawamura, Koshigaya, and Shojiro Horiguchi, Tokyo, both of Japan, assignors to Dainichieseika Color & Chemicals Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1973, Ser. No. 341,793
Claims priority, application Japan, Nov. 16, 1972, 47-114250
Int. Cl. C09b *31/02, 33/02, 35/02*
U.S. Cl. 260—157 **5 Claims**

1. In a process for preparing a high molecular weight azo pigment by coupling a diazo component with a coupling component, the improvement which comprises:

preparing a solution or a partial dispersion of a diazo component by diazotizing a primary aromatic amine in a hydrophobic aromatic solvent having a boiling point greater than 150°C, preparing a solution or a partial dispersion of a coupling component having two coupling positions in said hydrophobic aromatic solvent and forming a coupling reaction mixture by mixing the solution or partial dispersion of the diazo component with the solution or partial dispersion of the coupling component.

3,900,460

WATER-SOLUBLE DISAZO COMPOUNDS CONTAINING A PYRAZOLE COMPONENT

Johannes Dehnert, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

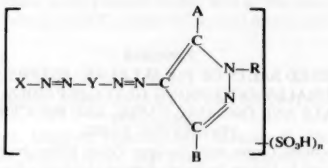
Filed Feb. 20, 1973, Ser. No. 333,783

Claims priority, application Germany, Feb. 26, 1972, 2209255

Int. Cl. C09b *43/00*; D06p *1/06*, *1/38*

U.S. Cl. 260—160 3 Claims

1. A water-soluble disazo dye of the formula



in which

A is hydrogen, methyl or phenyl;

B is hydrogen, methyl or phenyl;

X is phenyl; naphthyl; or phenyl substituted by chloro, bromo, methyl, methoxy, ethoxy, nitro or sulfamoyl;

Y is p-phenylene; p-phenylene substituted by chloro, bromo, methyl, methoxy or ethoxy; or 1,4-naphthylene;

R is hydrogen; alkyl of 1 to 7 carbon atoms; hydroxyalkyl of 2 or 3 carbon atoms; aminoalkyl of 2 or 3 carbon atoms; cyanoethyl; cyclohexyl; benzyl; phenyl; or phenyl substituted by chloro, nitro, cyano, amino or methyl; and

n is 1 or 2, the sulfo groups being bound to X, Y or R.

3,900,461

LYMPHOCYTE STROMA ADSORBENT

Billie J. Wilson, and Arthur Malley, both of Beaverton, Oreg., assignors to The United States of America as represented by the Secretary of Health, Education and Welfare, Washington, D.C.

Continuation-in-part of Ser. No. 228,308, Feb. 22, 1972, abandoned. This application Sept. 22, 1972, Ser. No. 291,347

Int. Cl. C08b *19/08*

U.S. Cl. 260—209 D 1 Claim

1. A reusable immunoadsorbent for the purification of antibody against lymphocytes which consists of lymphocyte stroma conjugated to a cyanogen bromide activated cross-linked dextran polymer base wherein said dextran is cross-linked with epichlorohydrin.

3,900,462

PROCESS FOR CONCENTRATING A POLYSACCHARIDE SUSPENSION

Taro Komatani; Kazuo Yamada, both of Hyogo; Eizo Oguri, Kobe, and Yasunori Tokuda, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Oct. 16, 1973, Ser. No. 406,853

Claims priority, application Japan, Oct. 16, 1972, 47-103378; Nov. 20, 1972, 47-116467

Int. Cl.² C08B *37/00*

U.S. Cl. 260—209 R 5 Claims

1. A process for concentrating a suspension of a thermally gelable polysaccharide composed predominantly of β-1,3-glucan, which comprises dissolving the chloride or hydroxide of calcium, magnesium or zinc in an amount between 0.03 and 0.75 mol/l in a suspension of said polysaccharide; then making the suspension alkaline to a pH above 12 so as to dissolve the suspended polysaccharide; adding an acid to the resultant solution to precipitate the polysaccharide: and finally recovering the polysaccharide.

3,900,463

PROCESS FOR PREPARING ALKALI CARBOXYMETHYL CELLULOSE

Akira Yada, Uji, and Yuji Hori, Kyoto, both of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co. Ltd., Osaka, Japan

Continuation of Ser. No. 884,346, Dec. 11, 1969, abandoned. This application Aug. 13, 1971, Ser. No. 171,780

Claims priority, application Japan, Dec. 14, 1968, 43-91766; July 9, 1969, 44-54680

Int. Cl.² C08B *11/00*

U.S. Cl. 260—231 CM 10 Claims

1. A process for preparing alkali carboxymethyl cellulose having a uniform distribution of the degree of substitution which comprises treating cellulose with an etherifying agent selected from the group consisting of alkali monochloroacetate and lower alkyl monochloroacetate in the presence of water and at least one organic solvent therefor, until the uniform distribution of the etherifying agent into the cellulose is attained, and then adding an alkali to the resulting mixture, said etherifying agent being present in an amount of 0.4 to 2.0 mol per cellulose glucose anhydride unit, and water is used in the amount satisfying the following inequality:

$$\frac{1}{X} \times \frac{72}{89} \leq Y \leq \frac{1}{X} \times \frac{792}{223}$$

wherein Y is the ratio of the weight of water to that of the etherifying agent and X is the mol number of said etherifying agent per cellulose glucose anhydride unit, the weight of the organic solvent is not less than that of water, said alkali being present in not less than an amount equimolar with said alkali monochloroacetate or not less than twice the molar amount of said alkyl monochloroacetate.

3,900,464

6-ACYL DERIVATIVES OF AMINOPENICILLANIC ACID

Andre Furlenmeier, Basel; Paul Lanz, Muttenz; Peter Quitt, Fullinsdorf, all of Switzerland; Karl Vogler, deceased, late of Riehen, Switzerland; by Franziska Vogler, heir, Riehen, Switzerland; by Niklaus E. Vogler, heir, Riehen, Switzerland, and by Heinrich Vogler, heir, Riehen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

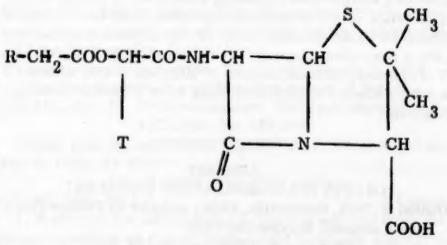
Filed Dec. 27, 1972, Ser. No. 318,728

Claims priority, application Switzerland, Jan. 12, 1972, 436/72

Int. Cl.² C07D *499/46*

U.S. Cl. 260—239.1 4 Claims

1. A compound represented by the formula



wherein R is selected from the group consisting of tetrazolyl, oxazolyl and isoxazolyl which can be substituted with halogen, C_1–C_5 alkyl, C_1–C_3 alkoxy of C_1–C_3 alkylthio and T is C_2–C_5 alkyl,

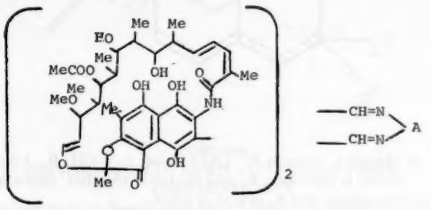
pharmaceutically acceptable salts thereof and hydrates of said salts.

3,900,465
3-FORMYLRIFAMYCIN AZINES

Renato Cricchio, Varese, and Giancarlo Lancini, Pavia, both of Italy, assignors to Gruppo Lepetit, S.p.A., Milano, Italy

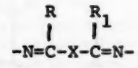
Filed Apr. 5, 1973, Ser. No. 348,364
Claims priority, application Italy, May 31, 1972
Int. Cl. C07d *41/00, 41/06, 87/54*
U.S. Cl. 260—239.3 P 6 Claims

1. A rifamycin represented by the formula



and 25-desacetyl and 16, 17; 18, 19; 28, 29-hexahydro derivatives thereof wherein: Me represents methyl; and A represents: (1) a direct bond connecting the 2 nitrogen atoms or (2)

wherein *y* represents —CO—, —CNH—, —CS— or —SO_2— or 1 to 12 carbon atom alkylene, cyclo-alkylene having 3 to 8 carbon atoms, phenylene, biphenylene or naphthylene, or xylylene and R_2 and R_3 independently represent hydrogen, lower alkyl or taken together represent ethylene connecting the two terminal nitrogen atoms or (3)



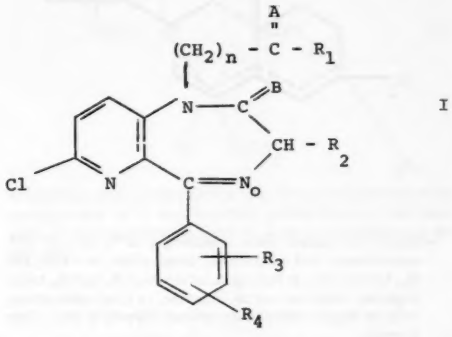
wherein X represents a direct bond between the 2 carbon atoms, 1 to 12 carbon atom alkylene, 3 to 8 carbon atom cycloalkylene, phenylene, biphenylene, naphthylene, bipyridylene or bithiazolylene and R and R_1 independently represent hydrogen, methyl, cyclohexyl, phenyl, o-hydroxyphenyl, m-trifluoromethylphenyl, 3,5-dibromo-4-hydroxyphenyl, 3-methoxy-4-hydroxyphenyl, 3,4-methylenedioxyphenyl, p-isobutylphenyl, pyridyl or taken together represent 1 to 8 C atom alkylene connecting the 2 terminal carbon atoms.

3,900,466
6-AZA-3H-1,4-BENZODIAZEPINES

Walter von Bebenburg, Buchschlag, and Heribert Offermanns, Grossauheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Filed May 8, 1974, Ser. No. 468,088
Claims priority, application Austria, May 25, 1973, 4628/73
Int. Cl. C07d *57/04*
U.S. Cl. 260—239.3 B 12 Claims

1. A compound of the formula:



wherein

n is an integer from 1 to 4;

R_1 is alkyl of 1 to 6 carbon atoms, a hydroxy group, an amino group, an aloxy group having 1 to 6 carbon atoms, a phenyl group or a phenyl group substituted with alkyl of 1 to 6 carbon atoms, an alkoxy group of 1 to 6 carbon atoms, trifluoromethyl, fluorine or chlorine;

A is oxygen, sulfur, the imino group, or an alkylimino group having 1 to 6 carbon atoms, or when R_1 is phenyl or substituted phenyl A also is two alkoxy groups having 1 to 6 carbon atoms or alkylenedioxy with 2 to 4 carbon atoms or —C(R_1)=A is the cyano group;

B is oxygen, sulfur, an imino group or an alkylimino group having 1 to 6 carbon atoms;

R_2 is hydrogen, a hydroxy group, an alkyl group with 1 to 6 carbon atoms, an alkoxy group with 1 to 6 carbon atoms, or the group —$O(CH_2)_n$ — C(=A)—R_1;

N_o is nitrogen or an NO group; and

R_3 and R_4 are hydrogen, chlorine, fluorine, the trifluoromethyl group, alkyl groups of 1 to 6 carbon atoms or alkoxy groups with 1 to 6 carbon atoms, the tautomeric forms thereof and pharmaceutically acceptable salts thereof.

8. A compound according to claim 1 wherein the group C(R_1)=A is cyano, B is oxygen, R_2 is hydrogen, hydroxy or alkoxy with 1 to 4 carbon atoms, R_3 is hydrogen, chlorine or fluorine, and R_4 is hydrogen.

3,900,467
PROCESS FOR THE MANUFACTURE OF β13-OXO-7α-ACETYLTHIO-17 βHYDROXY 4-ANDROSTENE-17αYL)-PROPIONIC ACIDγ-LACTONE

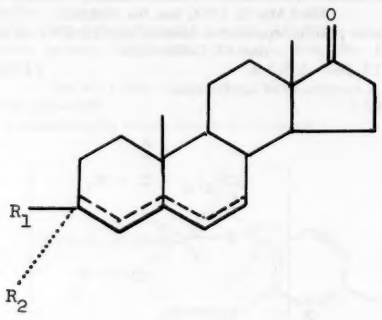
Klaus Irmscher, Darmstadt; Josef Kramer, Seeheim, and Herbert Nowak, Darmstadt, all of Germany, assignors to Hoechst Aktiengeselischaft, Frankfurt am Main, Germany

Filed July 26, 1973, Ser. No. 382,661
Claims priority, application Germany, July 28, 1972, 2237143
Int. Cl.[2] C07J *17/00*
U.S. Cl. 260—239.55 C 5 Claims

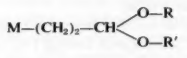
1. A process for making β-(3-oxo-7α-acetylthio-17β-

hydroxy-4-androstene-17α-yl)-propionic acid γ-lactone which comprises

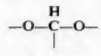
reacting a 17-oxo-steroid of the formula



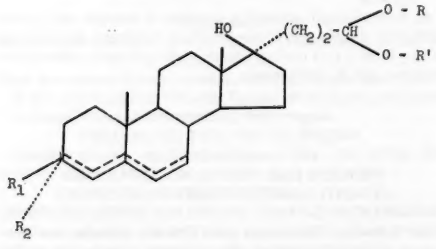
wherein the dashed lines represent a $\Delta^{3,5}$-, Δ^{5}-, or $\Delta^{4,6}$-unsaturation and wherein R_1, taken alone, is —OH, and R_2, taken alone, is hydrogen, or in which R_1 and R_2, taken together define an acetal, enamine, or enol ether group, with an organo-metallic compound, formed in situ, of the formula



wherein M is an alkali metal, R and R′, taken alone, are the same or different and are a hydrocarbon having 1 to 20 carbon atoms, and R and R′, taken together, are a hydrocarbon having 2 to 6 carbon atoms and are joined with the

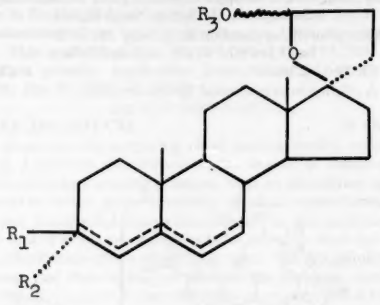


group to form a ring, whereby a γ-hydroxy-acetal of the formula



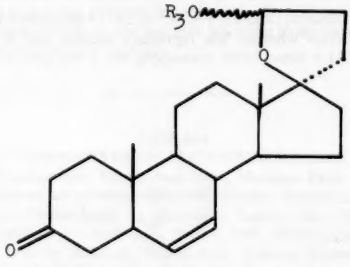
is formed, wherein R_1, R_2, R, and R′ are as earlier defined;

solvolyzing this γ-hydroxy-acetal with an acid and esterifying or etherifying the hydroxy group present in the semi-acetal group of the semi-acetal so formed, whereby a compound of the formula



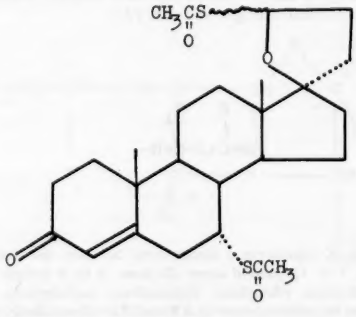
is obtained, wherein R_1, taken alone, is —OH, R_2, taken alone, is hydrogen, R_1 and R_2, taken together, define an oxo group, and R_3 is acyl or alkyl;

oxidizing the 3-OH group and dehydrogenating the resultant compound in the 6-position if R_1 is —OH, or only dehydrogenating the resulting compound in the 6-position if R_1 and R_2 together define a 3-oxo group, whereby a 3-oxo-6-dehydro compound of the formula



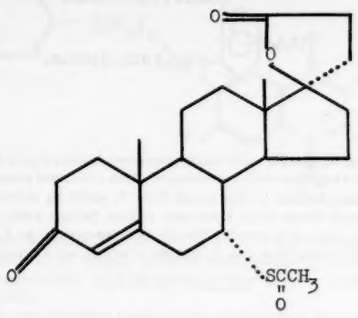
is formed;

reacting the 3-oxo-6-dehydro compound with thioacetic acid, whereby a dithioacetate of the formula



is formed;

and oxidizing the dithioacetate under acid conditions to form the corresponding γ-lactone,



3,900,468

CEPHALOSPORAN DERIVATIVES AND THEIR PREPARATION

Jacques Martel, Bondy, and René Heymes, Romainville, both of France, assignors to Roussel UCLAF, Paris, France

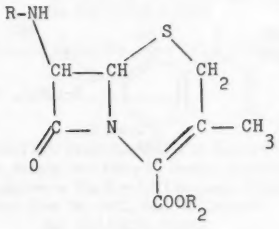
Filed Feb. 15, 1972, Ser. No. 226,526

Claims priority, application France, Feb. 18, 1971, 71.05555; Feb. 18, 1971, 71.05556

Int. Cl. C07d *99/24*

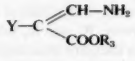
U.S. Cl. 260—243 C 4 Claims

1. A process for the preparation of a compound of the formula



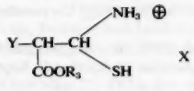
II

in the form of cis, trans or cis-trans mixtures wherein R is selected from the group consisting of hydrogen and trityl and R_2 is lower alkyl of 1 to 6 carbon atoms optionally substituted with a chlorine and phenylalkyl of 7 to 15 carbon atoms comprising the steps of reacting an enamine of the formula



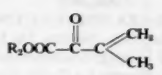
III

wherein R_3 is selected from the group consisting of alkyl of 1 to 10 carbon atoms and phenylalkyl of 7 to 15 carbon atoms and Y is selected from the group consisting of cyclic imido, benzoylamino and thiobenzoylamino with hydrogen sulfide in the presence of an acid of the formula HX wherein X is selected from the group consisting of chlorine, bromine, $—SO_4H$ and $—SO_3H$ to form a thioaminal of the formula



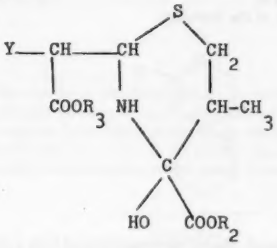
IV

which occurs in erythro and/or threo isomeric form, reacting the latter in the presence of a tertiary amine with an ester of α-keto-β-methylene-butyric acid of the formula



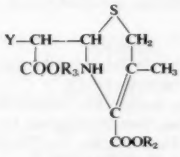
V

wherein R_2 has the above definition to form a 1,3-thiazane of the formula



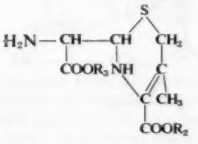
VI

in the form of its erythro and/or threo form independent of the configuration of 3- and 4-carbon atoms, reacting the latter with an acid dehydrating agent to form a 1,3-thiazine of the formula



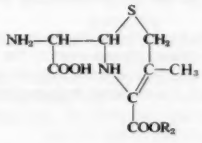
VII

occurring in the form of its erythro and/or threo isomers, subjecting the latter to reaction with hydrazine for a functional exchange to form a compound of the formula



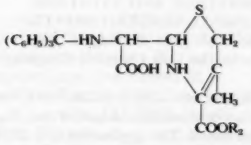
VIII

occurring in the form its erythro and/or threo isomers, selectively saponifying the latter with a dilute aqueous alkali metal base to form a compound of the formula



IX

occurring in the form of its erythro and/or threo isomers, reacting the latter with trityl chloride to form a compound of the formula



X

occurring in the form of its erytro and/or threo isomers and cyclizing the latter with a dialkylcarbodiimide or dicycloalkylcarbodiimide lactamization agent to form a compound of formula II wherein R is trityl.

3,900,469

7-OXA-3-THIA-1-AZA SPIRO[5,5]UNDEC-1-ENE

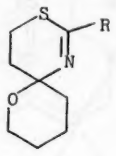
Noal Cohen, Montclair, N.J.; Wijitha De Silva, Niedersteinmaur, and Gerhard Hueppi, Gockhausen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed July 3, 1974, Ser. No. 485,653

Int. Cl.[2] C07D *279/06*

U.S. Cl. 260—243 R **7 Claims**

1. A compound of the formula



wherein R is phenyl; phenyl monosubstituted with a chloro, lower alkyl or lower alkoxy group; or pyridyl; and the acid addition salts thereof.

3,900,470

ESTERS OF BENZOTHIAZINE-1,1-DIOXIDES DERIVATIVES

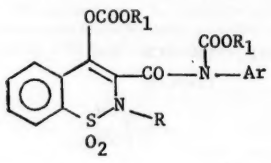
Chris Royce Rasmussen, Ambler, Pa., assignor to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Filed Sept. 23, 1974, Ser. No. 508,117

Int. Cl. C07d *93/02*

U.S. Cl. 260—243 R **2 Claims**

1. A compound represented by the formula



wherein

R is lower alkyl

R_1 is selected from the group consisting of lower alkyl, benzyl, phenyl,

Ar is an aryl radical selected from the group consisting of phenyl and substituted phenyl wherein the substituent in said substituted phenyl is selected from the group consisting of lower alkyl, lower alkoxy, halo and trifluoromethyl.

3,900,471

PHENYLENE AND XYLYLENE BIS(AMINECARBOTRITHIOATES)

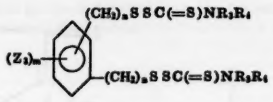
Joseph E. Dunbar, and Joan H. Rogers, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 166,258, July 26, 1971, Pat. No. 3,810,890, which is a continuation-in-part of Ser. No. 682,511, Nov. 13, 1967, abandoned. This application Oct. 25, 1973, Ser. No. 409,552

Int. Cl. C07c *155/10;* **C07d** *87/46, 29/36*

U.S. Cl. 260—246 B **2 Claims**

1. A compound corresponding to the formula



wherein R_3 and R_4 individually represent loweralkyl or hydrogen and together with the nitrogen atom represent piperidinyl or 4-morpholino, n represents 0 or 1, each Z_3 individually represents lower-alkyl, hydrogen, chloro, bromo, iodo, loweralkoxy, nitro or loweralkylthio and m represents 1 to 4, inclusive, not more than two Z_3 groups of which are iodo or nitro.

3,900,472

ANTHRAQUINONE DYES CONTAINING A 2-ARYLOXY ALKOXY CARBAMATE MOIETY, THEIR INTERMEDIATES, AND A PROCESS FOR THEIR PREPARATION

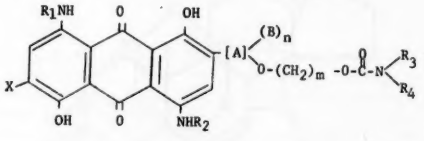
Charles H. Chang, Piscataway, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Dec. 20, 1971, Ser. No. 210,109

Int. Cl. C07d *87/46*

U.S. Cl. 260—247.1 A **16 Claims**

1. A compound of the formula



in which A is a phenyl, naphthyl, anthracenyl or phenanthryl radical: B is hydrogen, lower alkyl, lower alkylmercapto, amino, lower alkylamino, di-lower alkyl amino, halogen or phenylamino; n is an integer of from 1 to 4; each of R_1, R_2, R_3, and R_4 is hydrogen, lower alkyl, cycloalkyl of 3 to 6 carbon atoms or phenyl; alternatively, R_3 and R_4 taken together with the nitrogen atom to which they are attached form a heterocyclic ring selected from the group consisting of pyrrolidine, piperidine, piperazine, and morpholine; X is SO_3H or hydrogen; and m is an integer of from 1 to 4.

3,900,473

QUINOXALINE-DI-N-OXIDE DERIVATIVES

Peter J. Diel, Basel, and Wolfgang Schmid, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

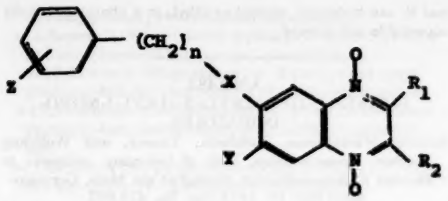
Filed Sept. 4, 1973, Ser. No. 393,863

Claims priority, application Switzerland, Sept. 5, 1972, 13032/72

Int. Cl.[2] C07D *241/40*

U.S. Cl. 260—250 Q **8 Claims**

1. A compound of formula



wherein

each of R_1 and R_2 is hydrogen, lower alkoxycarbonylmethyl, lower alkyl, phenyl, benzoyl, lower alkanoyl, lower alkoxycarbonyl, N,N-di-lower-alkylcarbamoyl, cyano or amino,

or R_1 and R_2 taken together is polymethylene having from 3 to 5 carbon atoms,

Y is hydrogen or halogen,

X is oxygen, sulphur, sulphinyl or sulphonyl,

Z is hydrogen, lower alkyl, trifluoromethyl, halogen or lower alkoxy, and

n is 0, 1 or 2.

3,900,474

TRIFLUOROALKYL, FLUOROBENZYL, PENTAFLUOROBENZYL, FLUOROBENZENESULFONYL, AND PENTAFLUOROBENZENESULFONYL THEOPHYLLINES

Roger D. Ginger, Park Ridge, Ill., and Carlos M. Samour, Wellesley, Mass., assignors to The Kendall Company, Walpole, Mass.

Filed May 14, 1973, Ser. No. 360,260

Int. Cl.² C07D *473/08*

U.S. Cl. 260—256 **7 Claims**

1. The compound having the name 7-(2,2,2-trifluoroethyl)-theophylline.

3,900,475

CERTAIN PHENOBARBITAL SALTS

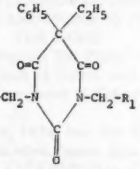
Julius A. Vida, Boston, and Mary L. Hooker, Cambridge, both of Mass., assignors to The Kendall Company, Walpole, Mass.

Filed June 26, 1972, Ser. No. 265,977

Int. Cl.² C07D *239/64*

U.S. Cl. 260—256.4 C **7 Claims**

1. A compound having the structural formula



wherein R is Y^+X^-, Y being a 2-thiouronium or N-phenyl-2-thiouronium group or hexamethylenetetramine; X being bromine or chlorine, and R_1 is hydrogen or R.

3,900,476

2[2'-PYRIMIDYLAMINO]QUINAZOLINES AND THEIR PREPARATION

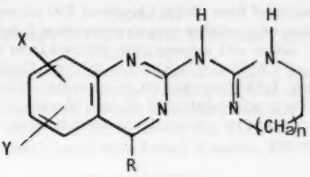
Harold E. Renis, Portage, and Louis L. Skaletzky, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 17, 1973, Ser. No. 361,311

Int. Cl.² C07D *239/84*

U.S. Cl. 260—256.4 Q **13 Claims**

1. A compound selected from those of formula:



and the non-toxic pharmaceutically acceptable acid addition salts thereof wherein X and Y are each selected from hydrogen, halgoen, lower alkyl of one to six carbon atoms inclusive and lower alkoxy of one to six carbon atonis, inclusive; R is lower alkyl of one to six carbon atoms, inclusive, and *n* is 0 or 1.

3,900,477

5-AMINO-AND 5-HYDRAZINODIHYDROPYRROLOISOQUINOLINE DERIVATIVES

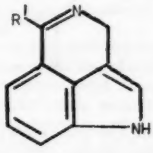
Adolf H. Philipp; Christopher A. Demerson, both of Montreal, and Leslie G. Humber, Dollard des Ormeaux, all of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Filed Nov. 6, 1973, Ser. No. 413,418

Int. Cl.² C07D *217/12*

U.S. Cl. 260—288 CF **8 Claims**

1. A compound of the formula



in which R^1 is amino, lower alkylamino, di(lower)alkylamino, di(lower)alkylamino(lower)alkylamino in which the alkylene portion thereof has 2 to 6 carbon atoms and the alkyl portion thereof has from 1 to 6 carbon atoms, when a straight chain alkyl, and from 3 to 4 carbon atoms, when a branched chain alkyl, hydrazino, 2-(lower)alkylhydrazino,2,2-di(lower)alkylhydrazino and isopropylidenehydrazino.

3,900,478

2-METHYL-2-PIPERIDINO-3'-(TRIFLUOROMETHYL) PROPIOPHENONE

John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 29, 1973, Ser. No. 327,352

Int. Cl.² C07D *295/00*

U.S. Cl. 260—293.8 **2 Claims**

1. A compound having the name 2-methyl-2-piperidino-3'-(trifluoromethyl)propiophenone.

3,900,479

PROCESS FOR THE CYCLIALKYLATION OF AMINES

Stephen N. Massie, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 27, 1973, Ser. No. 428,644

Int. Cl.² C07D *295/00*

U.S. Cl. 260—293.64 **11 Claims**

1. A process for the preparation of a heterocyclic nitrogen compound which comprises cyclialkylating a primary amine by reaction thereof with a tetrahydrofuran or a tetrahydropyran at a temperature of from about 100°C. to about 300°C.

and a pressure of from about 1 to about 200 atmospheres in the presence of a catalyst system comprising 1,4-diazabicyclo[2.2.2] octane and a component selected from the group consisting of a hydrogen halide, a metal from Group VIII of the Periodic Table dispersed on an inorganic oxide support and a sulfonic acid-substituted divinyl benzene-styrene copolymer resin, and recovering the resultant heterocyclic nitrogen compound.

3,900,480

N-(2-PYRIDYL)-1-POLYMETHYLENEIMINOTHIOCARBOXAMIDES

William B. Dickinson, Albany, and Marcia P. Vaupotic, Sand Lake, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

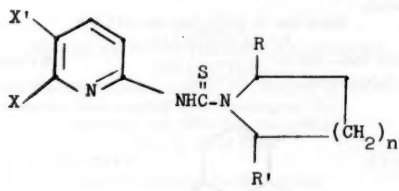
Continuation-in-part of Ser. No. 422,863, Dec. 7, 1973, abandoned, which is a division of Ser. No. 287,620, Sept. 11, 1972, Pat. No. 3,835,145. This application July 1, 1974, Ser. No. 484,443

Claims priority, application United Kingdom, Aug. 13, 1973, 38310/73; Mar. 1, 1974, 9414/74

Int. Cl. C07d *29/36*

U.S. Cl. 260—293.69 **19 Claims**

1. A compound having the formula



wherein:

X is hydrogen, lower-alkyl or lower-alkoxy;

X′ is hydrogen, bromine, chlorine, lower-alkyl, carbo-lower-alkoxy or di-lower-alkylamino;

R is lower-alkyl or hydroxymethyl;

R′ is hydrogen or lower-alkyl; and

n is 1 or 2 except that:

a. when X is hydrogen, X′ is lower-alkyl and *n* is 2, either both R and R′ are lower-alkyl or one is hydrogen and the other lower-alkyl; and

b. when X is hydrogen, X′ is lower-alkyl and *n* is 1, R and R′ are not both lower-alkyl.

3,900,481

DERIVATIVES OF PYRROLIDINE AND PIPERIDINE

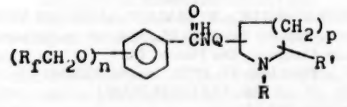
Elden H. Banitt, Woodbury, and William R. Bronn, St. Paul, both of Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.

Filed Apr. 1, 1974, Ser. No. 457,099

Int. Cl. C07d *29/30*

U.S. Cl. 260—293.77 **15 Claims**

1. A compound of the formula:



wherein R_f is a perfluoroalkyl radical containing from one to three carbon atoms, *n* is one to three, *p* is one or two, Q is a carbon-nitrogen bond, methylene or methylmethylene and R and R′ are hydrogen, methyl or ethyl, or a pharmaceutically acceptable salt thereof.

3,900,482

1-(PYRIDYL-THIOALKYL)-2-ALKYL-5-NITRO-IMIDAZOLES

Erhardt Winkelmann, Kelkheim, Taunus, and Wolfgang Raether, Dreieichenhain, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

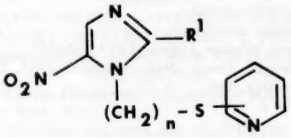
Filed Dec. 19, 1973, Ser. No. 426,081

Claims priority, application Germany, Dec. 21, 1972, 2262552

Int. Cl. C07d *31/40*

U.S. Cl. 260—294.8 G **3 Claims**

1. A 1-(pyridyl-thioalkyl)-2-alkyl-5-nitro-imidazole of the formula I



in which R_1 stands for hydrogen, methyl or ethyl, $-(CH_2)_n-$ stands for alkyl of from 2 to 4 carbon atoms, to which the pyridine ring is linked in 2-, 3- or 4-position via the sulfur atom.

3,900,483

γ-[2(1H)PYRIDONE]γ-PIVALYL-5-(γ-2,4-DI-T-AMYL-PHENOXYBUTYRAMIDE)-ACETANILIDES AND DERIVATIVES

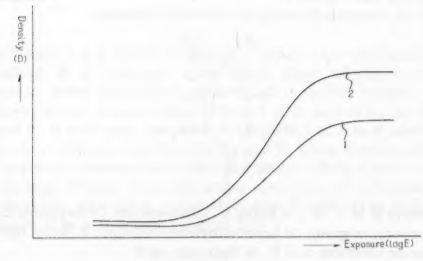
Wataru Fujimatsu; Shui Sato, both of Hachioji; Tamotsu Kojima, Kokubunji; Takaya Endo, Hino, and Kazumi Minahara, Hachioji, all of Japan, assignors to Konishiroku Photo Indusary Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1973, Ser. No. 351,031

Claims priority, application Japan, Apr. 15, 1972, 47-37367; May 27, 1972, 47-52179

Int. Cl.² C07D *31/44, 31/46*

U.S. Cl. 260—294.9 **1 Claim**



1. A compound selected from the group consisting of:

α-[2 (1H)-Pyridone]-α-pivalyl-2-chloro-5-(γ-2,4-di-t-amylphenoxybutyramide)-acetanilide;

α-[5-Chloro-2(1H)-pyridone]- α-pivalyl-2-chloro-5-[γ-(2,4-di-t-amylphenoxy)butyramide]-acetanilide;

α-[2(1H)-Pyridone]-α- 3-[α-(2,4-di-t-amylphenoxy)-butyramide]-benzoyl -2-methoxyacetanilide;

α-[3,5-Dibromo-2(1H)-pyridone]-α- 3-[α-(2,4-di-t-amyl-phenoxy)-butyramide]-benzoyl -2-methoxyacetanilide;

α-[3-Nitrile-2(1H)-pyridone]-α-pivalyl-2-chloro-5-[γ-(2,4-

di-t-amylphenoxy)-butyramide]-acetanilide;
α-[3-Bromo-2(1H)-pyridone]-α-pivalyl-2-chloro-5-[γ-(2,4-di-t-amylphenoxy)-butyramide]-acetanilide;
α-[5-Bromo-2(1H)-pyridone]-α- 3-[α-(2,4-di-t-amylphenoxy)-butyramide]-benzoyl -2-methoxyacetanilide;
α-[3,5-Dichloro-2(1H)-pyridone]-α- 3-[α-(2,4-di-t-amylphenoxy)-butyramide]-benzoyl -2-methoxyacetanilide; and
α-[5-Bromo-2(1H)-pyridone]-α-pivalyl-2-chloro-5-[γ-(2,4-di-t-amylphenoxy)-butyramide]-acetanilide.

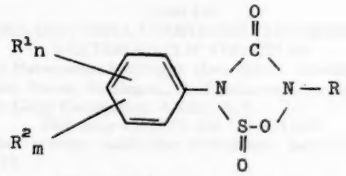
3,900,484

1,2,3,5-OXATHIADIAZOLIN-4-ONE,2-OXIDES

John Paul Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 14, 1974, Ser. No. 433,184
Int. Cl.² C07D *291/04*
U.S. Cl. 260—301 **11 Claims**

1. A compound of the formula



wherein R is lower alkyl, R^1 is lower alkyl, each R^2 is independently halo or trifluoromethyl, *n* is 1 or 0 and *m* is 1 or 2.

3,900,485

NEW SUBSTITUTED 1,2,4-THIADIAZOLIDINE-3,5-DIONES

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 10, 1967, Ser. No. 615,047
Int. Cl.² C07D *285/08*
U.S. Cl. 260—302 D **7 Claims**

1. 2-phenyl-4-methyl-1,2,4-thiadiazolidine-3,5-dione.

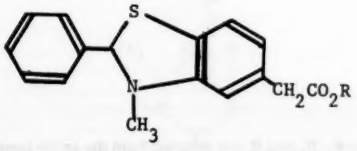
3,900,486

3-METHYL-2-PHENYL-5-BENZOTHIAZOLINE ACETIC ACID COMPOUNDS AND PROCESS FOR PRODUCING THE SAME

Tadayuki Suzuki, Koshigaya; Jin Wada, Soka; Hiroki Miyamatsu; Shinji Ueno, both of Tokyo, and Mitsuhiro Shimizu, Chiba, all of Japan, assignors to Tokyo Tanabe Company, Ltd., Japan

Filed Jan. 4, 1974, Ser. No. 430,915
Claims priority, application Japan, Jan. 23, 1973, 48-9158
Int. Cl.² C07D *251/72*
U.S. Cl. 260—304 **3 Claims**

1. A compound of the formula:



wherein R is a member selected from the group consisting of hydrogen and methyl.

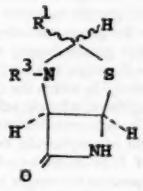
3,900,487

CERTAIN DIAZATHIABICYCLOHEPTANE DERIVATIVES

William George Elphinstone Underwood, Stoke Pages, and Alan Gibson Long, Greenford, both of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed July 30, 1971, Ser. No. 167,874
Claims priority, application United Kingdom, July 31, 1970, 37187/70
Int. Cl. C07d *99/10*
U.S. Cl. 260—306.7 C **7 Claims**

1. A compound selected from the group consisting of those of the general formula:



wherein:

R^1 is the residue of the group R^1CO, wherein R^1CO is $R^aC_nH_{2n}CO$-,

where R^a is phenyl, fluorophenyl, nitrophenyl, aminophenyl, acetoxyphenyl, methoxyphenyl, methylphenyl, hydroxyphenyl, N,N-bis(2-chloroethyl)aminophenyl, thien-2-yl, thien-3-yl, isoxazol-4-yl, pyridyl, tetrazolyl, 3-phenyl-5-methyl isoxazol-4-yl, or 3-chlorophenyl or 3-bromophenyl-5-methyl isoxazol-4-yl, and n is an integer from 1-4; and

R^3 is hydrogen; a hydrocarbyloxycarbonyl group selected from the group consisting of methoxycarbonyl, ethoxycarbonyl, t-butoxycarbonyl, 2,2,2-trichloroethoxycarbonyl, benzyloxycarbonyl, p-methoxybenzyloxycarbonyl, diphenylmethoxycarbonyl, adamantyloxycarbonyl, and p-nitrobenzyloxycarbonyl; an o or p-nitrophenylsulphenyl group; or a diphenylmethyl or triphenylmethyl group; and when R^3 is hydrogen the acid addition salts thereof.

6. 3-Methyl-4,7-diaza-6-oxo-2-thia-1(R),5(R)-bicyclo [3,2,0]-heptane.

7. 3-Methyl-4-chlorocarbonyl-4,7-diaza-6-oxo-2-thia-1(R),5(R)-bicyclo[3,2,0]-heptane.

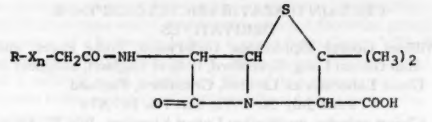
3,900,488

PRODUCTION OF 6-AMINOPENICILLANIC ACID

Fritz Huper, Wuppertal, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 21, 1972, Ser. No. 308,576
Claims priority, application Germany, Nov. 23, 1971, 2157970
Int. Cl.² C07D *499/42*
U.S. Cl. 260—306.7 C **12 Claims**

1. A process for the production of 6-aminopenicillanic acid which comprises contacting, in an aqueous medium, a penicillin and a water-insoluble polymer-enzyme derivative comprising penicillin acylase covalently bound to a carrier, wherein said penicillin is characterized by the structural formula:



wherein *n* is a whole figure selected from the group consisting of 0 and 1, X is a member selected from the group consisting of sulphur and oxygen, R is a member selected from the group consisting of alkyl groups having 2 through 6 carbon atoms, alkenyl groups having 3 through 6 carbon atoms, phenyl and monosubstituted phenyl groups in which the substituent is a member selected from the group consisting of chloro, bromo, iodo, fluoro, nitro, alkyl groups having from 1 to 6 carbon atoms inclusive, alkenyl groups having from 3 to 6 carbon atoms inclusive, and alkoxy in which the alkyl group has from 1 to 6 carbon atoms inclusive; wherein said carrier is an interpolymer composed of components containing from about 50 to 90 percent by weight of acrylamide, from about 2.5 to 25 percent by weight of N,N'-methylene-bis-acrylamide, and from about 5.0 to 30 percent by weight of maleic acid in the anhydride form, the total amount of said components being 100 percent by weight; and wherein the pH of the reaction medium is controlled and maintained in the range of from about 6.0 through about 8.0, and the temperature of the reaction medium is maintained in the range from about 20°C. to about 50°C.

3,900,489

PREPARATION OF 1,1'-PEROXYDICYCLOHEXYLAMINE

John O. Turner, West Chester, Pa., assignor to Sun Research and Development Co., Philadelphia, Pa.

Filed Jan. 2, 1973, Ser. No. 320,225

Int. Cl.[2] C07D *273/00*

U.S. Cl. 260—307 F **6 Claims**

1. A process for the production and recovery of 1,1'-peroxydicyclohexylamine and an aliphatic or alicyclic alcohol, which comprises reacting at a temperature of from −10°C to 50°C cyclohexanone and ammonia with a hydroperoxide of the formula ROOH, wherein R is a primary, secondary, or tertiary alkyl or cycloalkyl hydrocarbon group having from 3 to 12 carbon atoms, and recovering from the reaction mixture said 1,1'-peroxydicyclohexylamine and an alcohol of the formula ROH, wherein R is defined as above, and wherein the mole ratio of hydroperoxide to cyclohexanone is about 0.5:1.0.

3,900,490

ANTIINFLAMMATORY AND ANALGESIC OXADIAZOLO BENZODIAZOCINONES

Yutaka Kuwada; Hideaki Natsugari, and Kanji Meguro, all of Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Japan

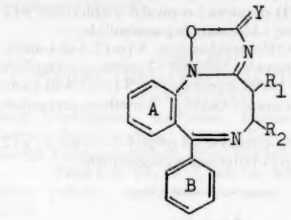
Filed Nov. 12, 1973, Ser. No. 414,843

Claims priority, application Japan, Nov. 13, 1972, 47-113600; Dec. 12, 1972, 47-124553

Int. Cl.[2] C07D *498/04*

U.S. Cl. 260—307 A **22 Claims**

1. A compound of the formula



wherein Y is O or S, R_1 and R_2 are hydrogen or lower alkyl of 1 to 2 carbon atoms and rings A and B are unsubstituted or independently may have up to two substituents selected from the group consisting of halogen, trifluoromethyl, lower alkyl of 1 to 4 carbon atoms and lower alkoxy of 1 to 4 carbon atoms, and pharmaceutically acceptable salts thereof.

3,900,491

1-(4-ISOXAZOLYL)-7-HYDROXY-2-HYDROXYIMINO HEPTANES

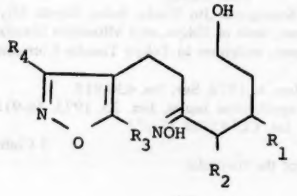
Gabriel Saucy, Essex Fells, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 259,724, June 5, 1972, Pat. No. 3,813,411, which is a division of Ser. No. 811, Jan. 5, 1970, Pat. No. 3,691,189. This application Feb. 25, 1974, Ser. No. 445,416

Int. Cl.[2] C07D *261/08*

U.S. Cl. 260—307 H **2 Claims**

1. A compound of the formula



V

wherein R_1, R_2 and R_4 are selected from the group consisting of hydrogen and lower alkyl and R_3 is selected from the group consisting of hydrogen, lower alkyl, toly, xylyl, benzyl and phenylethyl.

3,900,492

PHENYL- AND (SUBSTITUTED)-PHENYL-1,2,3-TRIAZOLE-ALKANOIC AND -ALKENOIC ACIDS

Robert Thomas Buckler, Edwardsburg, Mich.; Harold Eugene Hartzler, Elkhart, Ind.; Shin Hayao, Tokyo, Japan, and Gust Nichols, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed May 29, 1973, Ser. No. 364,609
Int. Cl.[2] C07D *249/06*
U.S. Cl. 260—308 A 2 Claims

1. 3-[5-phenyl-1,2,3, (1H)-triazole-1]-propionic acid.
2. 3-[4,5-diphenyl-1,2,3, (2H)-triazole-1]-propionic acid.

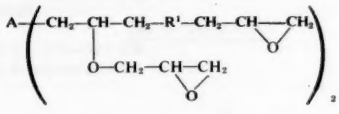
3,900,493

POLYGLYCIDYL COMPOUNDS CONTAINING N-HETEROCYCLIC STRUCTURE

Jürgen Habermeier, Pfeffingen; Hans Batzer, Arlesheim, and Daniel Porret, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

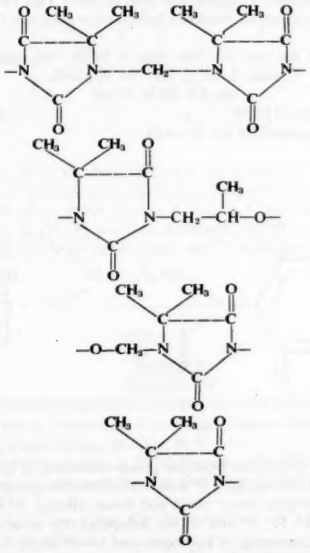
Filed June 19, 1973, Ser. No. 371,449
Claims priority, application Switzerland, June 23, 1972, 9528/72
Int. Cl. C07d *49/32, 51/20, 51/30*
U.S. Cl. 260—309.5 5 Claims

1. A polyglycidyl compound of the formula

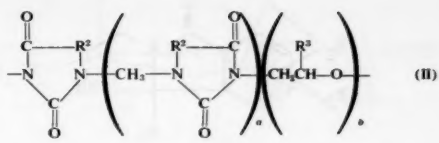


(I)

wherein A is an organic radical of the formula

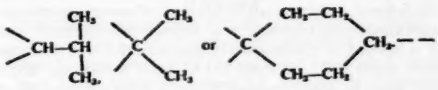


R^1 is a divalent radical of the formula



(II)

wherein *a* and *b* are identical or different and denote either 0 or 1;
R^3 is hydrogen or methyl;
and R^2 is one of the radicals



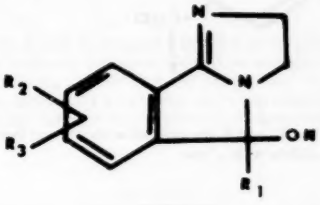
3,900,494

TETRAHYDROPYRIMIDINYL PHENYL CARBONYL ACID ADDITION SALTS, IMIDAZOLINYL PHENYL CARBONYL COMPOUNDS ACID ADDITION SALTS AND RELATED COMPOUNDS

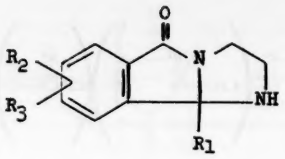
Theodore S. Sulkowski, Wayne, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 757,792, Sept. 5, 1968, Pat. No. 3,763,178, which is a continuation-in-part of Ser. Nos. 622,918, March 14, 1967, abandoned, Ser. No. 622,931, March 14, 1967, abandoned, Ser. No. 576,833, Sept. 2, 1966, abandoned, and Ser. No. 487,587, Sept. 15, 1965, abandoned.
This application Sept. 6, 1973, Ser. No. 394,705
Int. Cl.[2] C07D *49/34*
U.S. Cl. 260—296 T 2 Claims

1. A process for the production of a compound having the formula:



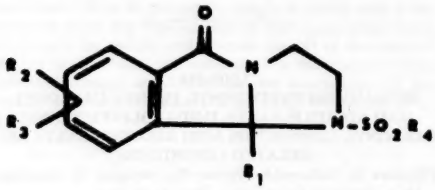
wherein R_1 is selected from the group consisting of hydrogen, lower alkyl, phenyl, phen(lower)alkyl, monohalophenyl, dihalophenyl, mono(lower)alkylphenyl, di(lower)alkylphenyl, trifluoromethylphenyl, mono(lower)alkoxyphenyl, di(lower) alkoxyphenyl, thienyl, pyridyl, furyl and tetrahydro-2-naphthyl; R_2 is selected from the group consisting of hydrogen, halogen, amino, lower alkylamino, lower alkyl and lower alkoxy; and R_3 is hydrogen when R_2 and R_3 are dissimilar and when R_2 and R_3 are the same they are both selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy, which comprises contacting a compound of the formula:



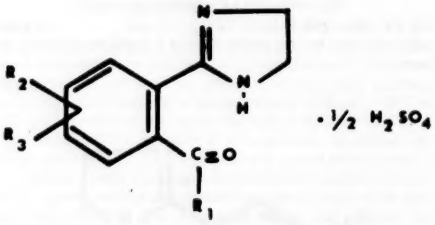
wherein R_1, R_2 and R_3 are defined as above, with a sulfonyl halide selected from the group consisting of those having the formula:

$$R_4SO_2X$$

wherein R_4 is selected from the group consisting of lower alkyl, phenyl, monohalophenyl, dihalophenyl, mono(lower) alkylphenyl, di(lower)alkylphenyl, trifluoromethylphenyl, mono(lower)alkoxyphenyl and di(lower)alkoxyphenyl and X is halogen, in pyridine at a temperature that is in the range from about 80°C. to about 115°C. for a period from about two hours to about fourteen hours, to form a compound of the formula:



wherein R_1, R_2, R_3 and R_4 are defined as above, and hydrolyzing said sulfonylimidazoisoindolone by treatment with from about 80 to about 100 percent sulfuric acid to form a sulfate of the formula:



wherein R_1, R_2, and R_3 are defined as above, and then contacting said sulfate with a base.

3,900,495

INTERMEDIATE INDOLINES

George Rodger Allen, Jr., Old Tappan, N.J.; Francis Joseph McEvoy, Pearl River, N.Y.; Vern Gordon DeVries, Ridgewood, N.J.; Daniel Bryan Moran, Suffern, N.Y., and Ruddy Littell, River Vale, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 147,700, May 27, 1971, Pat. No. 3,751,416. This application Apr. 12, 1973, Ser. No. 350,445

Int. Cl.[2] C07D *209/12*

U.S. Cl. 260—326.11 R **9 Claims**

1. 1-Benzoyl-3-(2-bromoethyl)-5,6-dimethoxy-2-methylindoline.

3,900,496

ANTHRAQUINONE DYESTUFFS

Hans Peter Kolliker, Munchenstein; Urs Karlen, Magden, and Peter Hindermann, Bottmingen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

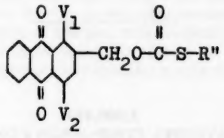
Filed Aug. 20, 1973, Ser. No. 389,824

Claims priority, application Switzerland, Aug. 22, 1972, 12431/72

Int. Cl.[2] C07D *27/00*

U.S. Cl. 260—326 C **12 Claims**

1. An anthraquinone dyestuff of the formula



wherein V_1 represents hydroxyl or —NH_2, V_2 represents hydroxyl, phenylamino or phenylamino ring-substituted by one substituent selected from chlorine and C_1–C_4-alkoxy or by one to three lower alkyl, and R'' represents C_1–C_4-alkyl, phenyl or phenyl substituted by one or two substituents selected from chlorine and lower alkyl.

3,900,497

DITHIANYL ANILIDS

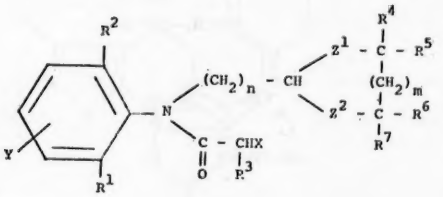
Sidney B. Richter, Chicago, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 357,746, May 7, 1973. This application June 3, 1974, Ser. No. 475,542

Int. Cl. C07d *73/00*

U.S. Cl. 260—327 M **2 Claims**

1. A compound of the formula



wherein Y is selected from the group consisting of hydrogen, lower alkyl and halogen; R^1 is selected from the group consisting of hydrogen, lower alkyl and lower alkoxy; R^2 is lower alkyl; R^3, R^4, R^5, R^6 and R^7 are independently selected from the group consisting of hydrogen and lower alkyl; X is halogen; m is the integer 1; Z^1 and Z^2 are sulfur; and n is an integer from 1 to 2.

3,900,498

2-THIETANOLS AND THEIR PREPARATION

Paul Dubs, Zug; Heiner Kuntzel, Oberengstringen, and Mario Pesaro, Zurich, all of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

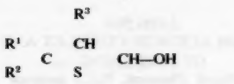
Filed Apr. 5, 1973, Ser. No. 348,444

Claims priority, application Switzerland, Apr. 12, 1972, 5353/72

Int. Cl. C07d *61/00*

U.S. Cl. 260—327 R 22 Claims

1. A 2-thietanol of the general formula



(I)

wherein R^1 represents a hydrogen atom or a C_{1-10} alkyl group, R^2 represents a hydrogen atom or a C_{1-3} alkyl group and R^3 represents a hydrogen atom or a C_{1-3} alkyl group.

3,900,499

(THIO) PHOSPHORIC ACID AND (THIO) PHOSPHONIC ACID ESTERS AND AMIDES

Gerhard Horlein, Frankfurt am Main; Gerhard Salbeck, Kelkheim, Taunus, and Ludwig Emmel, Bergen-Enkheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

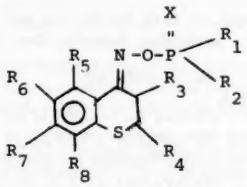
Filed Mar. 19, 1973, Ser. No. 342,491

Claims priority, application Germany, Mar. 24, 1972, 2214297

Int. Cl. C07d *65/08*

U.S. Cl. 260—327 TH 16 Claims

1. Compound of the formula



in which R_1 is O-alkyl, NH-alkyl, or N-dialkyl, R_2 is alkyl, O-alkyl, or phenyl, wherein the R_1 and R_2 alkyl constituent has 1 to 10 carbon atoms, R_3 and R_4 are each hydrogen or lower alkyl, R_5, R_6, R_7, R_8 are each hydrogen, halogen, lower alkyl, lower alkoxy or lower alkylthio, and X is oxygen or sulfur.

3,900,500

ESTERS OF HYDROXYMETHYL-DIOXABICYCLONONENE

Robert Burns Woodward, Cambridge, Mass., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

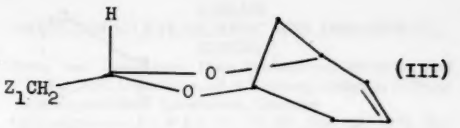
Filed Feb. 2, 1973, Ser. No. 329,255

Claims priority, application Switzerland, Feb. 10, 1972, 1945/72

Int. Cl. C07d *15/04*

U.S. Cl. 260—340.7 4 Claims

1. A racemic mixture consisting of a compound of the formula III



(III)

wherein Z_1 represents a hydroxy group esterified with an aliphatic or aromatic sulphonic acid, and the optical antipode thereof.

3,900,501

BENZOPHENONE INTERMEDIATES FOR 7-LOWER ALKANOYL BENZODIAZEPINES

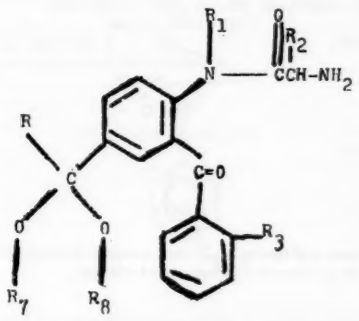
Robert Ye-Fong Ning, West Caldwell, and Leo Henryk Sternbach, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 101,117, Dec. 23, 1970, abandoned. This application Oct. 2, 1972, Ser. No. 293,967The portion of the term of this patent subsequent to Aug. 22, 1989, has been disclaimed.

Int. Cl. C07d *13/04*

U.S. Cl. 260—340.9 8 Claims

1. A compound of the formula



wherein R, R_1 and R_2 are each selected from the groups consisting of hydrogen and lower alkyl, R_3 is selected from the group consisting of hydrogen and halogen and R_7 and R_8 represent individually lower alkyl and when taken together represent the radical $(CH_2)_n$ wherein n is a whole integer from 2–3.

3,900,502

PROCESS FOR THE MANUFACTURE OF DELTA 14-20-ETO-21-DIALKOXY STEROIDS

Kurt Radscheit, Kelkheim, Taunus; Ulrich Stache, Hofheim, Taunus; Werner Fritsch, Neuenhain, Taunus, and Werner Haede, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

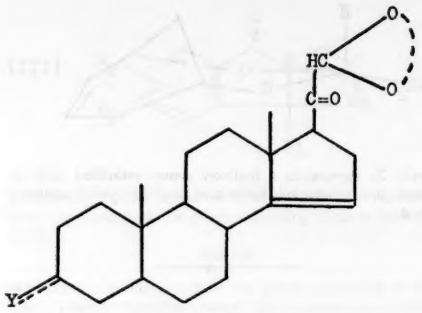
Continuation of Ser. No. 816,066, April 14, 1969, abandoned. This application June 30, 1971, Ser. No. 158,566

Claims priority, application Germany, Apr. 18, 1968, 1768226

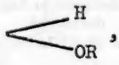
Int. Cl.[2] C07C *169/32*

U.S. Cl. 260—397.47 3 Claims

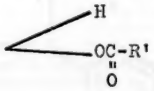
1. A Δ^{14}-20-keto-21-acetal steroid of the formula



and corresponding compounds having a Δ^4-unsaturation, wherein Y is a member selected from the group consisting of oxo; oxo ketalized with a monohydric or dihydric aliphatic alcohol or benzyl alcohol;



wherein R is lower alky, cyclohexyl, aralkyl, or tetrahydropyranyl; and



wherein

is aliphatic acyl having 1 – 20 carbon atoms, benzoyl, phenylacetyl, or cyclohexane-carbonyl; and wherein

is selected from the group consisting of acyclic acetals of lower alkanols or benzyl alcohol and cyclic acetals of dihydric alkanols haviong 2 – 5 carbon atoms.

3,900,503

RANDOMLY INTERESTERIFIED SUNFLOWER AND TOBACCOSEED C[illegible]

John P. McNaught, Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 77,757, Oct. 2, 1970, Pat. No. 3,746,551, Continuation-in-part of Ser. No. 10,313, Feb. 10, 1970, abandoned. This application Oct. 6, 1972, Ser. No. 295,744

Int. Cl. C11c *3/10*

U.S. Cl. 260—410.7 **2 Claims**

1. As a new component for margarine having a high polyunsaturated fatty acid content, randomly interesterified tobaccoseed oil wherein the fatty acids that can be obtained therefrom by hydrolysis or alkaline saponification followed by separation from an aqueous medium, have a polyunsaturated fatty acid content of at least 65 percent, based on the total fatty acid content.

2. As a new component for margarine having a high polyunsaturated fatty acid content, randomly interesterified sunflower oil wherein the fatty acids that can be obtained therefrom by hydrolysis or alkaline saponification followed by separation from an aqueous medium, have a polyunsaturated fatty acid content of at least 65 percent, based on the total fatty acid content.

3,900,504

CUPRAMMONIUM ACETATE COMPLEX AND METHOD OF PREPARING

Hans Woerner, Mount Pleasant, N.C., assignor to Mineral Research & Development Corporation, Charlotte, N.C.

Filed Feb. 4, 1972, Ser. No. 223,702

Int. Cl.[2] C07F *1/08*

U.S. Cl. 260—438.1 **3 Claims**

1. A method for producing a substantially non-corrosive cuprammonium acetate complex comprising reacting at atmospheric temperature and pressure copper acetate and ammonium acetate in a dilute aqueous ammonia solution at a pH between about 7.1 to 7.4, said reaction proportions being in amounts to provide an aqueous solution having a copper content of about 8 to 8.2 percent by weight.

3,900,505

CATALYSED REACTION OF ALUMINUM COMPOUNDS WITH NITRILES

Thomas Mole, East Melbourne, and Aivars Meisters, North Coburg, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Dec. 12, 1972, Ser. No. 314,384

Claims priority, application Australia, Dec. 13, 1971, 7363/71

Int. Cl. C07f *5/06*

U.S. Cl. 260—448 A **6 Claims**

1. A method for effecting the reaction of an aluminum compound selected from the class consisting of aluminum trialkyls, aluminum triaryls and aluminum triaralkyls with a nitrile having a formula $R^1 — C \equiv N$ wherein R^1 is a straight or branched-chain, saturated or unsaturated, aliphatic or cycloaliphatic, aralkyl or an aryl group which comprises reacting said compounds in the presence of a transition metal catalyst where the metal is coordinated to an oxygen containing ligand, said catalyst being selected from the group consisting of cobalt acetylacetonate, iron acetylacetonate, nickel acetate, nickel stearate, nickel acetylacetonate, nickel bisacetylacetonate, nickel bisacetylacetonate dihydrate, nickel bis(-dietheyl oxaloacetate), and nickel .3 (ethyl acetoacetate) .5 (OH).

3,900,506

FLAME RETARDANTS FOR PLASTIC FOAMS

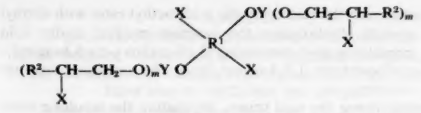
Reuben H. Bell, Granville, and Kevin M. Foley, Hebron, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 23, 1973, Ser. No. 418,708

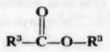
Int. Cl. C07f *7/04*, *7/18*

U.S. Cl. 260—448.8 A **6 Claims**

1. An addition product represented by the formula:



wherein R^1 is a divalent group selected from the group consisting of alkyl, alkoxy, cycloalkyl, cycloalkoxy, aryl, an ester represented by the formula



wherein each R^3 is a divalent group selected from the group consisting of alkyl, alkoxy, cycloalkyl or aryl, each R^3 having 1 to 20 carbon atoms, or an ether represented by the formula $R^3 - O - R^3$ is as defined above, or a combination thereof having from 1 to 50 carbon atoms; each R^2 is an alkyl radical having 1 to 20 carbon atoms, each X is chlorine, bromine or fluorine; one Y is phosphorus or the radical

and the other Y is silicon and each *m* is the integer 2 when Y is phosphorus or the radical PO and the integer 3 when Y is silicon.

3,900,507

ETHER AND THIOETHER CONTAINING THIOLESTERS

Friedrich Karrer, Basel, and Saleem Farooq, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

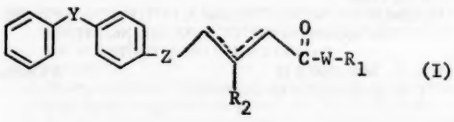
Filed Nov. 6, 1974, Ser. No. 521,314

Claims priority, application Switzerland, Nov. 9, 1973, 15812/73; Nov. 9, 1973, 15813/73; Oct. 9, 1974, 13565/74

Int. Cl.² C07C *157/07*

U.S. Cl. 260—455 R **8 Claims**

1. Compounds of the formula



(I)

wherein

R_1 represents C_1–C_4-alkyl,

R_2 represents methyl or ethyl,

Y represents O, $-CH_2-$, >C=O or S, and one of the radicals Z is oxygen or sulfur and W is sulfur.

3,900,508

PERFLUOROALKYLSULFONIC ACID AMINOPHENYL ESTERS

Peter Voss, Leverkusen; Hans Niederprum, Monheim, and Volker Beyl, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 76,255, Sept. 28, 1970, Pat. No. 3,803,199. This application Nov. 30, 1973, Ser. No. 420,497

Claims priority, application Germany, Oct. 17, 1969, 1952387

Int. Cl. C07c *143/08*

U.S. Cl. 260—456 A **4 Claims**

1. An aminosubstituted-aryl ester of perfluroalkylsulfonic acid of the formula

$$R_FSO_2O-Ar'(NR_2)_y$$

wherein

R_F is a perfluoroalkyl group of 6 to about 12 carbon atoms,

Ar' is phenyl or naphthyl,

R is independently hydrogen or an alkyl radical having 1 to 4 carbon atoms, and *y* is 1 or 2.

3,900,509

SUBSTITUTED BUTYL ESTERS OF ALKYL- AND HALOALKYL-SULFONIC ACIDS

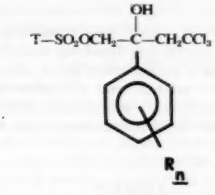
Lowell D. Markley, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 3, 1974, Ser. No. 466,568

Int. Cl. C07c *143/68*

U.S. Cl. 260—456 R **30 Claims**

1. A compound of the formfula



wherein *n* represents an integer of 0 to 3, inclusive; R is substituted in the 3, 4 or 5 positions and each R independently represents trifluoromethyl, alkyl of from 1 to about 3 carbon atoms, bromo, chloro, fluoro, nitro or alkoxy of from 1 to about 3 carbon atoms; and T represents alkyl of from 1 to about 18 carbon atoms or haloalkyl of from 1 to about 4 carbon atoms.

3,900,510

SULFURIC ACID ESTER OF 1-AMINOBENZENE-4-(β-HYDROXYETHYL-SULFONE)-2-SULFONIC ACID, THE 4-VINYLSULFONE COMPOUND THEREOF AND A PROCESS FOR THEIR PREPARATION

Hermann Fuchs, Kelkheim, Taunus, and Fritz Meininger, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

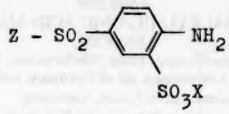
Filed Nov. 3, 1972, Ser. No. 303,626

Claims priority, application Germany, Nov. 5, 1971, 2154943

Int. Cl.² C07C *141/02*

U.S. Cl. 260—458 **3 Claims**

1. A compound of the formula



in which Z is $XO_3SO—CH_2CH_2—$ or $CH_2=CH—$ and X is hydrogen, sodium or potassium.

3,900,511

PROCESS FOR THE PREPARATION OF AMINOMETHYLENE MALONONITRILE

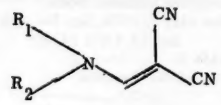
Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 338,018, March 5, 1973, Pat. No. 3,853,946, which is a division of Ser. No. 197,968, Nov. 11, 1971, Pat. No. 3,742,015, which is a division of Ser. No. 42,528, June 1, 1970, Pat. No. 3,655,716, which is a division of Ser. No. 719,834, April 9, 1968, Pat. No. 3,542,848. This application June 19, 1974, Ser. No. 480,660

Int. Cl.[2] C07C *120/00, 121/20*

U.S. Cl. 260—465.5 R **2 Claims**

1. A process of producing aminomethylene malonitrile from a dinitrile compound of the formula:



wherein R_1 and R_2 are lower alkyl containing from 1 to 6 carbon atoms; comprising dissolving said dinitrile in liquid ammonia at a temperature below about −70°C. to form a reaction mixture and thereafter bringing said reaction mixture to room temperature within a period of at least one hour to form aminomethylene malonitrile.

3,900,512

2-(6-CARBOMETHOXY-CIS-2-HEXENYL)-4(R)-HYDROXY-2-CYCLOPENTEN-1-ONE AND METHOD FOR PREPARING SAME

Charles J. Sih, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Nov. 12, 1973, Ser. No. 411,772

Int. Cl.[2] C07C *61/38, 69/74*

U.S. Cl. 260—468 K **1 Claim**

1. A method for preparing 2-(6-carbomethoxy-cis-2-hexenyl)-4(R)-hydroxy-2-cyclopenten-1-one which comprises:

reacting the pyrrolidine enamine of aceto-acetic ester with propargyl bromide

subjecting the resulting produce to alkaline hydrolysis and decarboxylation and recovering 5-oxo-1-hexyne

reacting the 5-oxo-1-hexyne with ethylene glycol in the presence of p-toluene sulfonic acid to obtain the corresponding cycloethylene ketal, 5-ethylenedioxy-1-hexyne subjecting the said ketal to treatment with lithium amide in liquid ammonia and to condensation with 1-bromo-4-tetrahydropyranyloxybutane in tetrahydrofuran to obtain the equivalent ethylene ketal-THP ether

subjecting the said ether to acid hydrolysis and recovering 9-oxo-5-decyn-1-ol

oxidizing the 9-oxo-5-decyn-1-ol with Jones reagent, esterifying the resulting product under acid conditions to obtain 9-oxo-5-decynoic acid methyl ester

hydrogenating the said ester over Lindlar's catalyst and recovering 9-oxo-5-cis-decenoic acid methyl ester

condensing the said decenoic acid methyl ester with diethyl oxalate, hydrolyzing the reaction product under acid conditions and recovering 2-(6-carboxy-cis-5-hexenyl)-cyclopentane 1,3,4-trione from the resulting reaction mixture

reesterifying the said trione, incubating the resulting ester with a microorganism of the order Ascomycetes and recovering 2-(6-carbomethoxy-cis-5-hexenyl)-4(R)-hydroxy-cyclopentane-1,3,-dione

enolizing the said dione to preferentially promote acylation or alkylation of the oxygen at the C-1 position and recovering the substituted C-1 enol

reducing the said substituted C-1 enol with a hydride reducing agent acidifying the reaction mixture and recovering 2-(6-carbomethoxy-cis-2-hexenyl-4(R)-hydroxy-2-cyclopenten-1-one from the reduction reaction mixture.

3,900,513

EXTRACT CONTAINING PROSTAGLANDINS

Ramon D. Hamilton, Portage, and William P. Schneider, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 159,479, July 2, 1971, Pat. No. 3,794,675, which is a continuation-in-part of Ser. No. 71,432, Sept. 11, 1970, abandoned. This application Oct. 25, 1973, Ser. No. 409,440

Int. Cl.[2] C07C *61/38, 69/74, 51/48, 67/48*

U.S. Cl. 260—468 D **12 Claims**

1. A composition comprising those substances obtained by extracting colonies or colony pieces of the marine invertebrate *Plexaura homomalla* (Esper), 1792, forma S or forma R, with a neutral organic liquid effective to extract PGA_2 or PGA_2 methyl ester from forma S or 15β-PGA_2 or 15β-PGA_2 methyl ester from forma R, said colonies or colony pieces having been previously maintained in contact with water in a temperature range up to 50° C. until substantially all of the C-15 acetates of the prostanoic acid derivatives originally present in the colonies or colony pieces are transformed to C-15 hydroxy prostanoic acid derivatives.

3,900,514

N-CYCLOALKYL HYDROXAMIC ACIDS

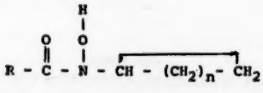
Cecil C. Chappelow, Jr., and James F. Engel, both of Kansas City, Mo., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Division of Ser. No. 149,750, June 3, 1971, Pat. No. 3,825,585. This application Oct. 29, 1973, Ser. No. 410,954

Int. Cl.[2] C07C *119/00, 103/75*

U.S. Cl. 260—500.5 H **6 Claims**

1. A compound of the formula



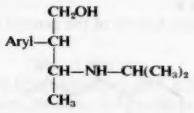
wherein R is selected from the group consisting of alkaryl, substituted alkaryl, aralkyl, substituted aralkyl, aryl and substituted aryl, radicals the substituted radicals being substituted with a member selected from the group consisting of halogen, nitro, alkoxy and phenoxy, said radicals having from 6 to 20 carbon atoms and n is an integer of from 3 to 6, inclusive.

3,900,515
2-ARYL-3-ISOPROPYLAMINO-1-BUTANOLS

Elvio Bellasio, Como, and Franco Cristiani, Pavia, both of Italy, assignors to Gruppo Lepetit, S.p.A., Milan, Italy

Filed May 8, 1972, Ser. No. 251,037
Claims priority, application Italy, May 21, 1971, 24389/71
Int. Cl. C07c *91/00*
U.S. Cl. 260—501.17 7 Claims

1. A 2-aryl-3-isopropylamino-1-butanol of the formula

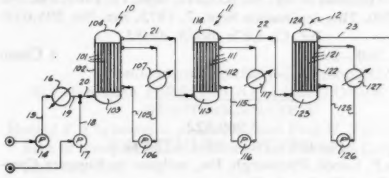


wherein aryl represents phenyl or substituted phenyl wherein the substituents are selected from dichloro, amino, and lower alkylsulfonamido; and a salt thereof with a pharmaceutically acceptable acid.

3,900,516
PROCESS FOR MAKING ACRYLAMIDE

Darrell L. Werges, Park Forest, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Filed Nov. 1, 1973, Ser. No. 411,821
Int. Cl. C07c *103/08*
U.S. Cl. 260—561 N 34 Claims



1. A process for catalytically hydrolyzing acrylonitrile to acrylamide under liquid phase conditions comprising continuously passing sequentially through at least two tubular reaction zones in a plug flow manner a liquid reactant feed composition comprising from about 25 to 75 wt. % acrylonitrile and from about 25 to 75 wt. % water on a 100 wt. % total reactant feed composition basis, each one of said reaction zones

a. containing a fixed catalyst bed,

b. the catalyst comprising each of said beds being characterized by having an initial activity of at least about 0.25 based upon a starting feed composition of 35 wt. % acrylonitrile and 64 wt. % water, total composition basis, using an arithmetic mean catalyst bed temperature of 210°F., a catalyst bed volume of about 50 cubic inches and an evaluation weight hourly space velocity which is sufficient to produce 80 percent conversion of acrylonitrile to acrylamide,

said process

a'. being conducted substantially isothermally at temperatures in the range of from about 100° to 300°F. and

b'. having a system weight hourly space velocity in the range of from about 0.1 to 10 hours $^{-1}$,

the interrelationship between said system weight hourly space velocity and the temperature, respectively, in each one of said reaction zones being such that the percentage conversion of acrylonitrile to acrylamide in each one of such reaction zones ranges from about 0.5 to 1.5 times said total system conversion divided by the total number of said reaction zones.

34. In an improved process for hydrolyzing with a fixed bed catalyst acrylonitrile to acrylamide of the type employing three tubular reaction zones through which in normal process operation a reactant composition comprising from about 25 to 75 weight percent acrylonitrile and from about 25 to 75 weight percent water on a 100 weight percent total composition basis is passed sequentially, substantially isothermally, and under liquid phase conditions, each of said reaction zones containing a bed of Raney copper catalyst which has an initial catalytic activity of at least about 0.25 based upon a starting feed composition of 35 weight percent acrylonitrile and 65 weight percent water, total composition basis, using an arithmetic means catalyst bed temperature of 210°F., a catalyst bed volume of about 50 cubic inches and an evaluation weight hourly space velocity which is sufficient to produce 80 percent conversion of acrylonitrile to acrylamide, the improvement which comprises the steps of

a. removing from service one of said three tubular reaction zones, and

b. passing said reactant composition sequentially, substantially isothermally, and under liquid phase conditions through the remaining two of said three tubular reaction zones at a system weight hourly space velocity in the range from about 0.5 to 10 hours^{-1} while maintaining the first of said remaining two reaction zones at a temperature range from about 100° to 250 °F. and the second of said remaining two reaction zones at a temperature ranging from about 120° to 300°F., the conversion of starting acrylonitrile to acrylamide after passing through the first of said remaining two reaction zones being from about 15 to 55 percent, and being from about 35 to 99 percent after passing through the second of said remaining two reaction zones.

3,900,517
CONVERSION OF NITRILE TO ITS CORRESPONDING AMIDE USING IMPROVED COPPER OXIDE CATALYST

Jerry J. Svarz, LaGrange, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 292,216, Sept. 25, 1972, Pat. No. 3,846,495. This application Nov. 29, 1973, Ser. No. 420,037
Int. Cl. C07c *103/08*
U.S. Cl. 260—561 N 4 Claims

1. A process for catalytically hydrolyzing acrylonitrile to acrylamide, the improvement comprising contacting a reactant feed of acrylonitrile in the presence of water with an activated copper oxide prepared by the following steps:

A. Contacting an aqueous slurry of copper oxides for ½ to 3 hours at a temperature within the range 0°–90°C with a dilute aqueous solution of from 5–20% by weight of an alkali metal hydroxide and a powdered aluminum to yield a slurry containing 1–75% by weight of copper oxide and 10 to 90% by weight based on said copper oxide of powdered aluminum to form an activated copper oxide catalyst.

B. filtering, washing and recovering said copper oxide catalyst.

3,900,518
HYDROXYL OR THIOL TERMINATED TELOMERIC ETHERS

Jack Milgrom, Concord, Mass., assignor to The General Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 130,776, April 2, 1971, abandoned, which is a division of Ser. No. 676,712, Oct. 20, 1967, Pat. No. 3,654,224. This application Dec. 10, 1973, Ser. No. 423,194
Int. Cl.[2] C07C *93/14, 87/62*
U.S. Cl. 260—573 8 Claims

1. A process for the production of hydroxyl or thiol terminated alkylene ether telomers having an average molecular weight between 300 and 10,000 which comprises telomerizing polymerizable cyclic ether selected from the group consisting of ethylene oxide, 1,2-propylene oxide, 1,2-butene oxide, 2,3-butene oxide, 1,2-dodecane monoxide, isobutylene monoxide, 1,2-pentene oxide, isopentene oxide, 1,2-diisobutylene oxide, 1,2-hexene oxide, 1,2-heptene oxide,

allyl glycidyl ether, crotyl glycidyl ether, isoheptene oxide, 1,2-ocetene oxide, 1,2-nonene oxide, styrene oxide, 1,2-decene oxide, 1,2-hendecene oxide, methyl glycidyl ether, ethyl glycidyl ether, propyl glycidyl ether, phenyl glycidyl ether, 4-chloro phenyl glycidyl ether, butadiene monoxide, isoprene monoxide, oxetane (C_3H_6O), tolyl glycidyl ether, 3,3-dimethyl oxetane, 3-n-nonyl oxetane, 3-allyl-3-methyl oxetane, 3-vinyl-3-methyl oxetane, 1,2-pentadecene oxide, 3,3-diethyl oxetane, 3-ethyl-3-butyl oxetane, 3-chloromethylene oxetane, 3-chloromethyl-3-methyl oxetane, 3-methyl-3-ethyl oxetane, 4,5-epithio-1-pentene; 5,6-epithio-1-hexene; 5,6 -epithio-2-hexene; 9,10-epithio-1-decene; 7,8-epithio-2-methyl-1-octene; 1,2-epithio-1-(2-cyclopenten-1-yl) ethane; 3-allyloxy-1,2-epithio propane; 3-(2-butenyloxy)-1,2-epithio propane; 1,2-epithio-1-(3-cyclohexen-1-yl)ethane; 3-(1-methyl allyloxy)-1,2-epithio propane; 3-(1-methyl-2-butenyloxy)-1,2-epithio propane; 3-(2-cyclohexen-1-yloxy)-1,2-epithio propane; 3-(3-methyl-4-hexenyloxy)-1,2-epithio propane; ethylene sulfide; 2,3-epithio butane; 1,2-propylene sulfide; cyclohexene sulfide; isobutylene sulfide; styrene sulfide; vinyl thiirone; 1,2-octene episulfide; crotyl oxy-1,2-epithio propane; 2-butene sulfide; 2,3-dimethyl-2-butene sulfide; 3,3-dimethyl thiocyclobutane; 3-chloropropene sulfide; thiocyclobutane; allyl thio-1,2-epoxy propane; 3-(1-chloro-4-butenyloxy)-1,2-epithio propane; 3-(1-bromo-4-butenyl)-1,2-epithio propane; 3-(1fluoro-4-butenyl thio)-1,2-epithio propene; and 3-(1-iodo-4-hexenyl thio)-1,2-epoxy propane, and mixtures thereof, with a telogen selected from the group consisting of aniline, N-alkyl anilines, p-phenylene diamine, p-aminophenol, p-methyl aniline, m-chloro aniline, o-hexyl aniline, p-iodoaniline, m-bromoaniline, 2-methyl-4-chloroaniline, 4-(p-aminophenyl) butanol, N-phenyl hexamethylene diamine, N-(p-tolyl) diethylene triamine, naphthylamine, N-phenyl-N′ -naphthyl ethylene diamine and N-naphthyl-N′-hydroxy hexamethylene diamine, in the presence of a catalytic amount of a double metal cyanide complex catalyst.

3,900,519

PROCESS FOR PREPARING PARA-FLUOROANILINES

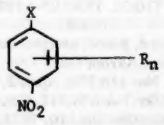
Walter A. Gay, Cheshire, and John H. Tobin, Hamden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed June 11, 1973, Ser. No. 366,946

Int. Cl.² C07C *85/11*

U.S. Cl. 260—580 **9 Claims**

1. A method for preparing p-fluoroaniline and substituted p-fluoroanilines which comprises reacting a compound of the formula:



where X is a halogen selected from the group consisting of chlorine, bromine and iodine; each R is independently selected from the group consisting of halogen and alkyl of 1 to 4 carbon atoms; and *n* is an interger of 0 to 4

with anhydrous hydrogen fluoride in the presence of a deoxygenating agent selected from the group consisting of elemental phosphorus, elemental sulfur, phosphorus trihalides, sulfur halides in which sulfur has a valence lower than 6, aryl phosphorus halides, aryl sulphenyl halides and triaryl phosphines.

3,900,520

MERCAPTO-BUTANONE SUBSTITUTED CYCLOHEXENES

Hanspeter Schenk, Zumikon, and Trudi Sigg-Grutter, Winterthur, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

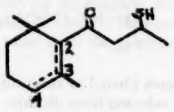
Filed Oct. 9, 1973, Ser. No. 404,582

Claims priority, application Switzerland, Oct. 17, 1972, 15189/72

Int. Cl.² C07C *49/48*

U.S. Cl. 260—586 R **3 Claims**

1. A cycloaliphatic ketone of the general formula



wherein the broken lines denote a double bond in the 2- or 3-position.

3,900,521

3,5-DISUBSTITUTED-2-HYDROXYACETOPHENONES

Andrew G. Kallianos; Albert H. Warfield, and Melvyn I. Simpson, all of Durham, N.C., assignors to Liggett & Myers Incorporated, New York, N.Y.

Division of Ser. No. 78,913, Oct. 7, 1970, Pat. No. 3,787,501, which is a division of Ser. No. 857,211, Sept. 11, 1969, Pat. No. 3,605,760. This application Sept. 7, 1973, Ser. No. 395,014

Int. Cl. C07c *49/78, 49/82*

U.S. Cl. 260—592 **1 Claim**

1. 3,5-Diisopropyl-2-hydroxyacetophenone.

3,900,522

PRODUCTION OF CATECHOL

Nicholas P. Greco, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed June 30, 1972, Ser. No. 268,035

Int. Cl. C07c *37/06*

U.S. Cl. 260—621 H **5 Claims**

1. A process for preparing catechol from dihydrocatechol, comprising:

adding dihydrocatechol at a controlled rate to a slurry of a noble metal catalyst and a refluxing solvent that is butyrolactone and that is at a refluxing temperature, said controlled rate of addition of dihydrocatechol being approximately equal to the rate at which the dihydrocatechol is dehydrogenated to catechol in the reaction medium.

3,900,523

METHOD FOR PURIFYING HYDROQUINONE AS WELL AS METHOD FOR PURIFYING AND RECOVERING HYDROQUINONE

Sugihiko Tada, Minami Ashigara; Yasuo Nishigaki, and Masatoshi Sugiyama, both of Odawara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Sept. 4, 1973, Ser. No. 394,209

Claims priority, application Japan, Sept. 4, 1972, 47-88525

Int. Cl.² C07C *37/22*

U.S. Cl. 260—621 A **14 Claims**

1. In a process which comprises oxidizing para-diisopropylbenzene to the corresponding dihydroperoxide and subjecting said dihydroperoxide in a solvent to acid decomposition followed by removal of said solvent by steam distillation to form a crude hydroquinone aqueous solution consisting essentially of water, hydroquinone, solvent and tar substances, the improvement which comprises recovering said hydroquinone from said crude hydroquinone aqueous solution by adjusting

the concentration of the hydroquinone in the aqueous solution to about 23 percent by weight or more at a temperature of about 60°C. or higher, stirring said aqueous solution, allowing said aqueous solution to stand to form two layers, and removing said tar substances as an upper layer while recovering said hydroquinone in the lower layer.

3,900,524

STABILIZED METHYLENE CHLORIDE

Norman L. Beckers, Humble, Tex., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 335,004, Feb. 23, 1973, abandoned, and a continuation-in-part of Ser. No. 335,368, Feb. 23, 1973, abandoned. This application May 13, 1974, Ser. No. 469,360

Int. Cl. C07c *17/42*

U.S. Cl. 260—652.5 R 2 Claims

1. A stabilized composition consisting essentially of methylene chloride and from about 0.001 to about 2.0 percent by weight of each of diisopropylamine, N-methyl pyrrole, butylene oxide and propylene oxide.

3,900,525

MANGANESE FERRITE CATALYZED OXIDATIVE DEHYDROGENATION

Harold F. Christmann, Seabrook, and Paul H. Teel, Houston, both of Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 253,820, May 16, 1972, Pat. No. 3,843,745, which is a division of Ser. No. 11,289, Feb. 3, 1970, abandoned. This application June 3, 1974, Ser. No. 475,786

Int. Cl. C07c *5/18*

U.S. Cl. 260—680 E 9 Claims

1. In a process for the vapor phase oxidative dehydrogenation acyclic non-quaternary hydrocarbons having 4 to 5 contiguous carbon atoms and having at least one

grouping or ethyl benzene to produce a corresponding hydrocarbon having a higher degree of unsaturation with a metal manganese ferrite catalyst wherein the improvement comprises using as the manganese ferrite catalyst a manganese ferrite prepared by preparing a solution of soluble metal components of iron and manganese, adding 0.1 to 4 weight percent of a soluble polyhydric organic compound based on the weight of metal to said solution said polyhydric compound having number average molecular weight of about 3000 to 400,000 and further being selected from the group consisting of polyesters derived from polybasic carboxylic acids and polyols; polyethers being the condensation products of ethylene oxide, propylene oxide and mixtures thereof with polyols; polysaccharides and mixtures thereof, contacting said solution of soluble metal components and polyhydric organic compound with a precipitating agent at a temperature in the range of 20° to 100°C and at a pressure of 0.5 to 50 atmospheres to precipitate insoluble metal component of iron and manganese, recovering a gelatinous material, and heating said gelatinous material to form manganese ferrite.

3,900,526

SELECTIVE REMOVAL OF 1,2 POLYENES AND ACETYLENIC COMPOUNDS FROM CONJUGATED-DIENE FEED USING A NICKEL, IRON OR COBALT ARSENIDE CATALYST

Marvin M. Johnson; Donald C. Tabler, and Gerhard P. Nowack, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 249,726, May 2, 1972, Pat. No. 3,787,511, which is a division of Ser. No. 44,665, June 8, 1970, Pat. No. 3,697,448, which is a continuation-in-part of Ser. No. 6,971, Jan. 29, 1970, abandoned. This application Aug. 23, 1973, Ser. No. 390,799

Int. Cl. C07c *11/00*

U.S. Cl. 260—681.5 7 Claims

1. A process for hydrotreating conjugated diene-containing streams to selectively remove 1,2-polyenes, acetylenic compounds, and other unsaturated impurities present in said streams, which comprises contacting hydrogen and a conjugated diene feedstream containing 1,2-polyenes, acetylenes and other unsaturated impurities with a catalyst consisting essentially of an arsenide of nickel, iron, or cobalt at an elevated temperature sufficient to selectively hydrogenate and remove a substantial portion of said 1,2-polyenes and said acetylenes present in said feedstream without significant conversion of conjugated dienes to saturates, and recovering said conjugated diene feedstream substantially reduced in said 1,2-polyenes and said acetylenes.

3,900,527

PRODUCTION OF BASIC DYEABLE POLYESTER FROM TEREPHTHALIC ACID

Henry L. King, and John W. McGee, both of Cary, N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 16, 1973, Ser. No. 351,676The portion of the term of this patent subsequent to Aug. 12, 1992, has been disclaimed.

Int. Cl. C08g *17/01*

U.S. Cl. 260—75 S 10 Claims

1. A method for producing fiber-forming modified polyesters non-continuously which comprises (1) forming a reaction product consisting of at least 85% by weight of the polyester of an aromatic dicarboxylic acid and a polymethylene glycol selected from the group consisting of those having the formula $HO(CH_2)_nOH$, wherein n is an integer from 2 to 10, and cyclohexane dimethanol by reacting said acid and said glycol under esterification conditions until said reaction product has a carboxyl level of not more than 2000 μeq/g and an intrinsic viscosity of not more than 0.07; and (2) reacting with said reaction product a glycol solution of a bis glycol ester of a difunctional aromatic compound possessing a metallo sulfonate group of such concentration that when said bis glycol ester is mixed with said prepolymer, the resulting glycol/dicarboxylic acid moiety ratio is at least about 1.6; and copolymerizing and polycondensing said reactants at a temperature in the range of from about 65° C to about 325° C until the resulting polymer attains an intrinsic viscosity in the range of about 0.3 –0.8.

3,900,528

PROCESS FOR IMPACT MODIFICATION OF HIGH NITRILE POLYMERS

Ludwig A. Beer, Agawam, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 9, 1973, Ser. No. 404,448

Int. Cl. C08f *19/08*

U.S. Cl. 260—876 R 8 Claims

1. A process for preparing rubber modified nitrile polymer compositions which comprises:

A. admixing

1. a rubbery polymer substrate having a butadiene content of 68 to 72 percent by weight and a styrene content of 28 to 32 percent by weight based on the total weight of the butadiene-styrene rubbery substrate which rubbery substrate is further characterized as

having a refractive index in the range of from 1.5375 to 1.5425, a particle size in the range of from 0.06 to 0.2 micron, a gel content in the range of from 40 to 95 percent, a swelling index in the range of from 10 to 40, and a second order transition temperature (Tg) less than −40°C.; and

2. a first polymerizable monomer composition comprising:
   a. from 0.1 to 2 percent by weight of a nonconjugated diolefin monomer;
   b. from 0 to 30 percent by weight of an ethylenically unsaturated nitrile monomer selected from the group consisting of acrylonitrile, and mixtures of acrylonitrile and methacrylonitrile;
   c. from 40 to 60 percent by weight of a vinylidene aromatic hydrocarbon monomer; and
   d. from 20 to 50 percent by weight of an alkyl ester of acrylic or methacrylic acid wherein the alkyl group contains from 1 to 8 carbon atoms, wherein the percent by weight is based on the total weight of the monomer in the first polymerizable monomer mixture;

B. heating the admixture to a temperature in the range of from 30° to 100°C. in the presence of a polymerization catalyst to effect polymerization of said monomer formulation and grafting of the polymer being produced onto the rubbery polymer substrate to form a graft copolymer, said graft copolymer having a superstrate to substrate ratio of at least 10:100;

C. admixing said graft copolymer with a second polymerizable composition comprising from 55 to 85 percent by weight of an ethylenically unsaturated nitrile monomer selected from the group consisting of acrylonitrile and mixtures of acrylonitrile and methacrylonitrile which contains up to 20 percent by weight of methacrylonitrile based on the total weight of acrylonitrile and methacrylonitrile and from 15 to 45 percent by weight of a monovinylidene aromatic hydrocarbon monomer wherein the percent by weight is based on the total weight of the monomers in the second polymerizable monomer mixture; and

D. heating the second mentioned admixture to a temperature in the range of from 30° to 100°C. in the presence of a polymerization catalyst to effect polymerization of the monomers thereof and to produce grafting of the polymer being produced onto said graft copolymer to form a composite graft copolymer, said grafted polymers of said first and second admixtures providing a grafted superstrate which contains a total of at least 40 percent by weight ethylenically unsaturated nitrile monomer and wherein the ratio of grafted superstrate to substrate is in the range of from 15–200:100;

E. blending the polymerization product of steps A to D above with a matrix polymer which comprises from 55 to 85 percent, based on the total weight of the polymer, of an ethylenically unsaturated nitrile monomer selected from the group consisting of acrylonitrile and mixtures of acrylonitrile and methacrylonitrile which contain up to 20 percent by weight of methacrylonitrile based on the total weight of acrylonitrile and methacrylonitrile and from 15 to 45 percent of a monovinylidene aromatic hydrocarbon monomer;

wherein the resulting blend contains from 3 to 50% by weight of the rubbery polymer substrate.

3,900,529

RUBBER MODIFIED HIGH NITRILE POLYMERS AND POLYMER BLENDS PRODUCED THEREBY

Ludwig A. Beer, Agawam, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 9, 1973, Ser. No. 404,527
Int. Cl. C08f *19/08*
U.S. Cl. 260—876 R **13 Claims**

1. A polymeric composition comprising:

A. a butadiene-styrene rubbery substrate having a butadiene content of 68 to 72 percent by weight and a styrene content of 28 to 32 percent by weight based on the total weight of the butadiene-styrene rubbery substrate which rubbery substrate is further characterized as having a refractive index in the range of from 1.5375 to 1.5425, a particle size in the range of from 0.06 to 0.2 micron, a gel content in the range of from 40 to 95 percent, a swelling index in the range of from 10 to 40, and a second order transition temperature (Tg) less than −40°C.; and

B. a superstrate grafted onto the rubbery substrate in two separate stages which superstrate comprises:

1. as the first stage graft, the polymerization product of a first polymerizable monomer composition comprising:
   a. from 0.1 to 2 percent by weight of a nonconjugated diolefin monomer;
   b. from 0 to 30 percent by weight of an ethylenically unsaturated nitrile monomer selected from the group consisting of acrylonitrile, and mixtures of acrylonitrile and methacrylonitrile which contain up to 20 percent by weight of methacrylonitrile;
   c. from 40 to 60 percent by weight of a vinylidene aromatic hydrocarbon monomer; and
   d. from 20 to 50 percent by weight of an alkyl ester of acrylic or methacrylic acid wherein the alkyl group contains from 1 to 8 carbon atoms, wherein the percent by weight is based on the total weight of the monomer in the first polymerizable monomer mixture; and

2. as the second stage graft, a second polymerizable monomer composition comprising from 55 to 85 percent by weight of an ethylenically unsaturated nitrile monomer selected from the group consisting of acrylonitrile and mixtures of acrylonitrile and methacrylonitrile which contain up to 20 percent by weight of methacrylonitrile based on the total weight of acrylonitrile and methacrylonitrile and from 15 to 45 percent by weight of a monovinylidene aromatic hydrocarbon monomer wherein the percent by weight is based on the total weight of the monomers in the second polymerizable monomer mixture;

wherein the grafted superstrate contains a total of at least 40 percent by weight ethylenically unsaturated nitrile monomer and wherein the ratio of grafted superstrate to substrate is in the range of from 15–200:100.

3,900,530

METHOD FOR FORMING GRAFT COPOLYMERS EMPLOYING THE REACTION PRODUCT OF HYDROGEN PEROXIDE AND ETHYLENE-ACRYLIC ACID ALKALI SALT COPOLYMERS

James E. Crawford, Adrian, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 1, 1974, Ser. No. 456,653
Int. Cl. C08f *15/00*
U.S. Cl. 260—877 **19 Claims**

1. A process for producing a polymeric acrylonitrile acrylate-ethylene graft polymer comprising: combining, in water, a water soluble, copolymeric alkali metal salt of ethylene-acrylic acid with acrylonitrile and, optionally, a monoethylenically unsaturated polymerizable monomer selected from the group consisting of lower alkyl acrylates, lower alkyl methacrylates, vinyl aromatics, vinlyidene halides, vinyl halides, and mixtures thereof; releasing hydrogen peroxide into said combination in an amount sufficient to form a free radical initiator with said copolymeric alkali metal salt, thereby forming a polymerization system; polymerizing said system with the sole free radical polymerization initiator consisting of the reaction product of said hydrogen peroxide and said copolymeric alkali

metal salt for a time and at a temperature sufficient to graft polymerize said acrylonitrile and, when present, said monoethylenically unsaturated monomer; recovering the polymerized product.

3,900,531

GRAFT OF ACRYLONITRILE, N-ARYL MALEIMIDE AND ALKENE UNTO A DIENE SUBSTRATE

Carl Fraser Mathews, Hitchin; Eric Nield, Watton-at-Stone; John Brewster Rose, Letchworth, and Peter Incledon Vincent, Welwyn Garden City, all of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 236,976, March 22, 1972, Pat. No. 3,816,563, Continuation-in-part of Ser. No. 860,100, Sept. 22, 1969, abandoned, which is a continuation of Ser. No. 539,738, April 4, 1966, abandoned. This application Jan. 28, 1974, Ser. No. 437,478

Claims priority, application United Kingdom, Apr. 9, 1965, 15191/65; Jan. 12, 1966, 1423/66

Int. Cl. C08f *15/00, 15/22*

U.S. Cl. 260—878 R **4 Claims**

1. A graft copolymer comprising

i. a substrate of a diene rubber containing 40 to 100% molar of at least one conjugated 1,3-diene monomer and from 0 to 60% molar of at least one ethylenically unsaturated monomer copolymerisable therewith using free radical catalyst and

ii. a superstrate, which contains from 45 to 90% molar of units from acrylonitrile, from 1% to 20% molar of units of at least one N-aryl maleimide and from 5 to 35% molar of units of at least one alkene containing 2 to 18 atoms.

3,900,532

LOW VISCOSITY PASTY RUBBER COMPOSITIONS

Manfred Dietrich, Leverkusen; Jochen Schnetger, Berg-Gladbach; Friedrich Haas, Schildgen; Günter Marwede, Leverkusen, and Hansgünter Appel, Bergisch-Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed July 2, 1973, Ser. No. 375,687

Claims priority, application Germany, July 7, 1972, 2233359

Int. Cl. C08f *15/10, 15/14*

U.S. Cl. 260—879 **3 Claims**

1. A pasty vulcanizable rubber mixture which is free of elemental sulphur comprising

a. 100 parts by weight of a high molecular weight rubber containing 0.5 to 8% by weight of OH or COOH groups,

b. 50 to 40 parts by weight of a liquid homopolymer or copolymer of a diene having a molecular weight of 400 to 10,000 and containing 0.5 to 8% by weight of OH or COOH groups and

c. 0.5 to 10 equivalents per equivalent of said OH and COOH groups present in said mixture of a crosslinking agent which is capable of reacting with the OH and COOH groups present.

3,900,533

FLAME RETARDANT POLYETHYLENE COMPOSITION AND COATING PROCESS

Joseph J. Krackeler, Los Altos Hills, and William G. Biddell, San Mateo, both of Calif., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Mar. 5, 1973, Ser. No. 337,982

Int. Cl. C08f *29/12*

U.S. Cl. 260—897 A **5 Claims**

1. A flame retardant polymeric composition for insulating coating of high voltage electrical wire or cable comprising the following ingredients:

a. about 45 to 85% of polymeric components comprising about 15 to 60% high density polyethylene and about 40 to 85% low density polyethylene;

b. fire retardant components comprising about 2 to 20% by weight, 1, 2, 3, 4, 6, 7, 8, 9, 10, 10, 11, 11-dodecachloro-1, 4, 4*a*, 5*a*, 6, 9, 9*a*, 9*b*-octahydro-1, 4, 6, 9-dimethanodibenzofuran and about 2 to 30% by weight 5-(tetrabromophenyl)-1, 2, 3, 4, 7, 7-hexachloronorbornene in a parts by weight ratio of 1/1 to 1/1.86, respectively; and

c. about 10 to 40% by weight of an antimony compound.

3,900,534

THERMOPLASTIC FILMS BASED ON BLENDS OF POLYPROPYLENE AND POLYBUTENE

Malcolm P. Schard, Califon, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 7, 1973, Ser. No. 357,754

Int. Cl. C08f *29/12*

U.S. Cl. 260—897 A **3 Claims**

1. A heat shrinkable biaxially oriented thermoplastic film comprising a resinous mixture containing:

a. from about 82% to about 88% by weight of a high isotactic content polypropylene resin; and

b. from about 12% to about 18% by weight of a high isotactic content polybutene resin;

said film having a thickness of from about 0.10 mil up to about 10 mils, said thermoplastic film being further characterized in that it has improved optical properties in comparison to film containing 20% by weight of said polybutene resin in said mixture and improved heat seal strength characteristics in comparison to films containing 10% by weight of said polybutene in said mixture.

3,900,535

TOXIC PHOSPHORUS COMPOUNDS

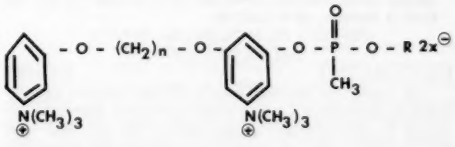
Gerard E. Natarelli, Jr., Bel Air, Md.; Frank G. Pinto, Middlesex, N.J., and Jacob I. Miller, Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 13, 1963, Ser. No. 265,594

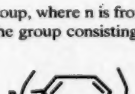
Int. Cl.[2] C07F *9/28*

U.S. Cl. 260—945 **7 Claims**

1. A new chemical toxic agent



where R is an alkyl group, where n is from 1 to 10, and where X^- is selected from the group consisting of



$4\ominus$ and $1\ominus$.

3,900,536
HALOGENATED ESTERS OF PHOSPHORUS-CONTAINING ACIDS

Gaetano F. D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617

Continuation-in-part of Ser. No. 179,543, Sept. 10, 1971, Pat. No. 3,780,144, which is a continuation of Ser. No. 785,335, Dec. 19, 1968, abandoned. This application July 30, 1973, Ser. No. 383,599
Int. Cl. C07f 9/40
U.S. Cl. 260—952 14 Claims

1. A phosphorus-halogen-containing compound having the formula

$$Z\left[-CH_2-\overset{O}{\overset{\|}{P}}(ORCX=CXR')_2\right]_n$$

wherein n represents an integer having a value of 1 to 4;

Z represents an organic monomeric nucleus of no more than 20 carbon atoms, valency of n and selected from the class consisting of aliphatic, aromatic and cycloaliphatic hydrocarbon radicals, combinations of 2–6 of said hydrocarbon radicals linked together by connecting groups —O—, —S—, —S(O)—, —S(O)$_2$—, —NH—, —NR''—, —C(O)—, —C(O)O—, —C(O)NH— or —C(O)NR''—, and derivatives of said hydrocarbon radicals in which the derivative group is —OR'', —OC(O)R'', —C(O)R'', —NR''$_2$, —NHR'' or —SR'';

X represents Cl or Br;

R represents a divalent hydrocarbon radical of 1–20 carbon atoms;

R' represents H, X or R''; and

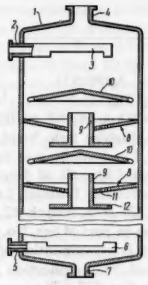
R'' represents a monovalent hydrocarbon radical of 1–20 carbon atoms.

3,900,537
COLUMN FOR HEAT-AND-MASS EXCHANGE BETWEEN GAS AND LIQUID

Anatoly Borisovich Tjutjunnikov, ulitsa Frunze, 17, kv. 34; Boris Nikanorovich Tjutjunnikov, ulitsa Frunze, 15, kv. 4; Alexandr Nikolaevich Marchenko, Kolodezny pereulok, 47/2; Viktor Leontievich Burin, Pavlovo Pole, 5 mikroraion, 54, kv. 26, all of Kharkov; Josif Mironovich Bolotin, ulitsa Sovetskaya, 29, Volgodonsk, Rostovskoi oblasti; Anatoly Sergeevich Drozdov, ulitsa Lenina, 66, kv. 29, Volgodonsk, Rostovskoi oblasti; Leonid Petrovich Koval, ulitsa Lermontova, 11, kv. 3, Volgodonsk, Rostovskoi oblasti; Zoya Vasilievna Didenko, ulitsa Lenina, 66, kv. 22, Volgodonsk, Rostovskoi oblasti; Georgy Vasilievich Ljubushkin, ulitsa Lermontova, 8, kv. 6, Volgodonsk, Rostovskoi oblasti; Jury Mikhailovich Budnik, pereulok Donskoi, 34, kv. 16, Volgodonsk, Rostovskoi oblasti; Vladimir Dmitrievich Moskvin, ulitsa Yakornaya, 7, kv. 28, and Dmitry Mikhailovich Bolyanovsky, ulitsa Sheremetievskaya, 71(b), korpus 18, kv. 73, both of Moscow, all of U.S.S.R.

Filed May 29, 1974, Ser. No. 474,313
Int. Cl. B01f 3/04
U.S. Cl. 261—122 2 Claims

1. A column for heat-and-mass exchange between gas and liquid comprising: a vertical shell; transverse partitions arranged in said shell one above another and provided with holes for the passage of liquid from said overlying transverse partition down to the underlying partition; downflow pipes secured in said holes of said transverse partitions; lower ends of said downflow pipes protruding from said transverse partition in which said downflow pipes are secured; circular portions of said transverse partitions adjoining said downflow pipes and provided with holes for the passage of gas; circular plates fastened to said lower ends of said downflow pipes, the area of said plates corresponding to that of said overlying circular portions of said transverse partitions with holes; bubbling bells secured above said downflow pipes; pipe connections admitting liquid into the upper part of the shell and discharging it from its lower part; pipe connections admitting

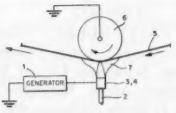


gas into the lower part of the shell and discharging it from its upper part.

3,900,538
METHOD FOR SURFACE TREATMENT OF PLASTICS

Ken-Ichi Kawakami; Kenji Hatada, and Yasuhiko Yamaguchi, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 13, 1973, Ser. No. 332,230
Claims priority, application Japan, Feb. 16, 1972, 47-15625
Int. Cl. B29c 25/00
U.S. Cl. 264—22 12 Claims

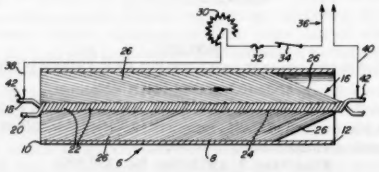


1. A method for the production of plastic materials having improved surface-bonding properties which comprises passing the plastic material through an electrically charged flame, said flame being continuous and electrically charged to create a corona in the presence of activated ions moving through the flame and impinging upon the surface of the plastic material.

3,900,539
ARTIFICIAL CHRISTMAS TREE WITH SLANTED NEEDLES

Salvatore J. Puleo, 15 Sequoia Dr., Watchung, N.J. 07201

Filed Mar. 7, 1973, Ser. No. 338,824
Int. Cl. A47g 33/06
U.S. Cl. 264—27 4 Claims



1. In combination, a tubular member having unobstructed inlet and outlet ends, an insertable and removable prefabri-

cated self-contained brush, said brush comprising an elongated stem-like core made up of a pair of like intertwisted core wires and complemental pliant bristles of thermoplastic plastic material which have median portions nested and retentively clenched between the twisted convolutions of said core wires, the diameter of the tubular member being less than the brush whereby flexible bristle half-portions projecting radially from the locale of said core will be obliquely angled when the brush is inserted through the tubular member, and electric current conducting wires connected to the end portions of the core wires outwardly of the ends of the tubular member for heating said core wires and subjecting the clenched median portions of said bristles to heat and causing the same to be reset while obliquely angled and in so doing setting the half-portions with a slant from the core toward one end of said core.

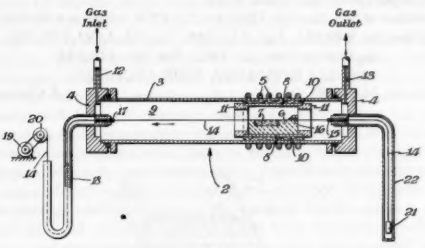
3,900,540
METHOD FOR MAKING A FILM OF REFRACTORY MATERIAL HAVING BI-DIRECTIONAL REINFORCING PROPERTIES

William A. Robba, Shoreham, N.Y., and Robert W. Froberg, Easton, Pa., assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 202,385, Nov. 26, 1971, abandoned, which is a continuation-in-part of Ser. No. 154,228, June 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 43,430, June 4, 1970, abandoned. This application Mar. 6, 1974, Ser. No. 448,651

Int. Cl. C01b *31/07*

U.S. Cl. 264—29 **10 Claims**



1. A method of making a thin film of substantially defect-free pyrolytic graphite which comprises: maintaining the temperature of an inert liquid substrate selected from the group consisting of copper, gold, tin, silver, palladium, lead, antimony, platinum, and glass below the melting point of graphite; and introducing a premixed source gas comprising a mixture of a hydrocarbon gas and a diluent gas selected from the group consisting of helium, neon, argon, krypton, xenon, radon, hydrogen and nitrogen at a distance above the surface of said liquid substrate, said surface being substantially smooth and stress-free; whereby said hydrocarbon gas decomposes upon contacting said surface to form a pyrolytic graphite film thereon.

3,900,541
METHOD OF RESTORING A WOODEN BEAM

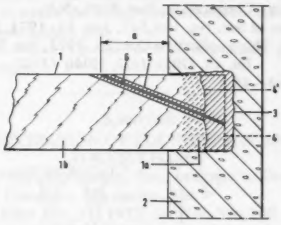
Dick Klapwijk, Brielle, Netherlands, assignor to Bouweconomisch en Technologisch Adviesbureau B.V., Rotterdam, Netherlands

Filed June 18, 1973, Ser. No. 370,827

Int. Cl. E04b *1/16*

U.S. Cl. 264—35 **4 Claims**

1. A method of restoring an end portion of a wooden beam forming a part of a building structure wherein the beam includes a solid portion and an end portion at least initially in structural engagement with a cooperating part of the building structure, and wherein at least a part of said end portion has disappeared through decay and the like and there is a confined hollow space between said solid portion and the cooperating part of the building structure in place of the part of the end portion, said method comprising the steps of boring a hole in the solid portion of the beam and in communication with the hollow space, said hole being elongated as compared to a transverse dimension thereof, placing a unitary mass of synthetic resin grout of the type having highly cementitious properties such as epoxy resin in the hollow space and into the hole



in filling relation with the grout bridging between the solid beam portion and the hollow space, placing a reinforcement within the hollow space and the hole with the reinforcement extending substantially the full length of the hole and the hollow space in the direction of the hole, and thereafter permitting the synthetic resin grout to harden to form a monolithic mass with the reinforcement embedded therein.

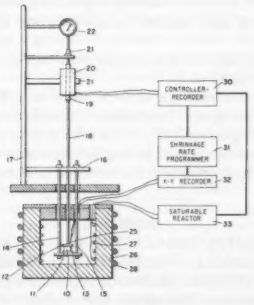
3,900,542
PROCESS FOR SINTERING FINELY DIVIDED PARTICULATES AND RESULTING CERAMIC PRODUCTS

Hayne Palmour, III, and Marvin L. Huckabee, both of Raleigh, N.C., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Apr. 26, 1973, Ser. No. 354,515

Int. Cl.[2] C04B *35/64*

U.S. Cl. 264—40 **24 Claims**



1. In a process for forming sintered ceramic structures including the steps of compacting finely divided particulate material, with or without an ignitable binder, to form a green structure and then heating the green structure to the onset of shrinkage, the improvement comprising sintering the heated green structure through three sequential rate regimes of progressively decreasing densification rates from said onset of shrinkage, the said densification rate in each regime being below the critical rate at which gas entrapment is effected and discontinuous grain growth is induced, the third of said regimes being continually decreasing and the first and second of said regimes being linear; said first of said regimes being defined between said onset of shrinkage and the attainment of between about 0.70 and about 0.75 fractional density; said second of said regimes being defined between about 0.70 and 0.75 fractional density and the attainment of between about

0.82 and about 0.87 fractional density; and said third of said regimes being defined between about 0.82 and about 0.87 fractional density and the attainment of final density.

3,900,543

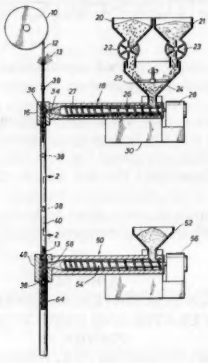
METHOD FOR MAKING A FOAM SEISMIC STREAMER

Billy W. Davis, Flagstaff, Ariz., assignor to Schlumberger Technology Corporation, New York, N.Y.

Division of Ser. No. 105,547, Jan. 11, 1971, Pat. No. 3,744,016. This application Oct. 26, 1972, Ser. No. 301,047

Int. Cl. G01v *1/02;* **H04b** *13/02*

U.S. Cl. 264—45.3 **5 Claims**



1. A method of manufacturing a neutral buoyancy seismic hydrophone streamer having a plurality of hydrophone transducers which comprises:

admixing a thermoplastic resin with gas filled microspheres to obtain a mixture having a specific gravity less than 1; conveying said mixture to the heating zone of an extruder;

heating said mixture to a temperature sufficient to melt said thermoplastic resin;

extruding said mixture at a pressure less than about **300** pounds per square inch about a central streamer assembly comprising a cable-like stress member to produce a syntactic foam extrudate having a central stress member; and affixing hydrophone transducers to said extrudate.

3,900,544

METHOD FOR THE CONTINUOUS EXTRUSION OF MULTIPLE SMALL CROSS-SECTION THERMOPLASTIC POLYMERIC RESINOUS FOAM PROFILES

Keith G. Johnson, Pittsburgh, and Anthony Paul Limbach, Downingtown, both of Pa., assignors to ARCO Polymers, Inc., Philadelphia, Pa.

Filed Nov. 28, 1973, Ser. No. 419,785

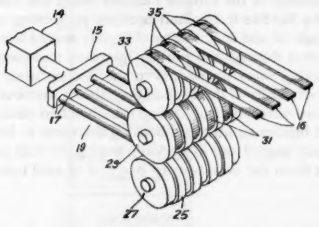
Int. Cl.[2] B29D *27/00;* **B29F** *3/08*

U.S. Cl. 264—45.5 **2 Claims**

1. A method of preparing multiple continuous extrudates having predetermined cross section profiles, from thermoplastic polymeric resinous material containing a blowing agent, comprising:

a. forcing said material in a molten condition through a die having a multiplicity of orifices into an unconfined zone of lower pressure; thereby providing a multiplicity of extrudates in a softened but unexpanded condition so that partial expansion of each extrudate occurs in the unconfined zone;

b. passing each of the partially expanded extrudates through a confined passage of predetermined configuration and formed from cooling wall surfaces moving with said extrudate to shape said extrudate into a predetermined cross section profile and to cool the surface layers of said



extrudate to a temperature sufficiently low to substantially solidify the surface layers of the material; and

c. thereafter alternately cooling one and then the other of the surface layers of each of said extrudates.

3,900,545

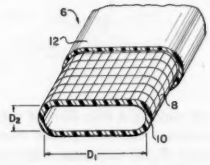
PROCESS FOR PRODUCING OBLONG HOSE

Alfred Korejwa, Crestline; Walter J. Layer, and Richard E. Ruda, both of Bucyrus, all of Ohio, assignors to Amerace Corporation, New York, N.Y.

Division of Ser. No. 101,156, Dec. 23, 1970, which is a division of Ser. No. 849,951, Aug. 14, 1969, Pat. No. 3,581,778. This application Nov. 16, 1973, Ser. No. 416,616

Int. Cl.[2] B29C *17/02;* **B29D** *3/02, 23/05*

U.S. Cl. 264—89 **5 Claims**



1. A process for producing an article useful as hose or the like comprising the following steps:

a. providing an extrudable material having elastic memory,

b. extruding said material about an oblong die to form a tube normally having an oblong inside transverse cross-section defining a flattened ribbon-like condition along substantially its entire length, said oblong inside transverse cross-section being characterized by a major inside transverse dimension D_1 and a minor inside transverse dimension D_2 which is substantially less than dimension D_1,

c. treating said tube to preserve its shape as extruded in step (b)

d. rounding out said tube,

e. applying a reinforcing layer to said rounded out tube throughout the length thereof, and

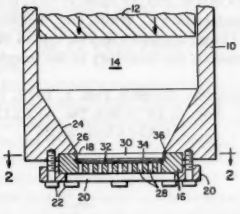
f. extruding an outer cover about the outer surface of said reinforced tube while maintaining said tube in a rounded out condition

whereby upon completion of step (f) the elastic memory of said tube material causes said reinforcing layer and said outer cover to assume a normally oblong inside transverse cross-section conforming to said flattened ribbon-like condition along substantially their entire length of said tube.

3,900,546
FILTERING EXTRUSION BATCH MATERIAL

Ralph M. Kaukeinen, Middlebury Center, Pa., assignor to Corning Glass Works, Corning, N.Y.

Filed Sept. 18, 1973, Ser. No. 398,380
Int. Cl. B28c *3/00*
U.S. Cl. 264—102 2 Claims

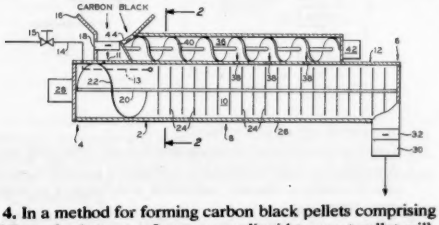


1. In the method of forming honeycomb articles from extruded ceramic batch material wherein ceramic batch material is extruded under pressure through a final extrusion die having a gridwork of narrow discharge slots to form thin-walled honeycomb ceramic articles, the improvement comprising a method of removing contaminants from the extrudable ceramic batch material prior to such material being extruded through the final extrusion die so as to avoid the clogging of the discharge slots thereof with such contaminants which comprises, initially blending ceramic batch material ingredients in a dry state, adding water to said ingredients and further mixing the batch material, subjecting said mixed batch material to a pressing force providing an extrusion pressure for extruding the same through a pre-extrusion die, and while subjected to said extrusion pressure and prior to passing through said pre-extrusion die, scalping said batch material of contaminant particles to thereby produce batch material of improved purity and homogeneity, immediately passing said scalped batch material through a pre-extrusion die in order to further plasticize and de-air the ceramic batch material, removing said ceramic batch material from said pre-extrusion die, and then subsequently press extruding said scalped and de-aired ceramic batch material through a separate final extrusion die unconnected to said pre-extrusion die and having a gridwork of narrow discharge slots to form thin-walled honeycomb ceramic articles.

3,900,547
APPARATUS AND METHOD FOR FORMING PELLETS

Harold R. Hunt, and John W. Vanderveen, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 19, 1973, Ser. No. 380,722
Int. Cl. C09c *1/56*
U.S. Cl. 264—117 7 Claims



4. In a method for forming carbon black pellets comprising adding a feed stream of an aqueous liquid to a wet pellet mill, adding a feed stream of flocculent carbon black to said mill, forming a mixture of said feed stream in a ratio of carbon black and liquid sufficient to form pellets of wet carbon black in said mill, agitating said mixture for forming wet carbon black pellets, recovering the wet carbon black pellets and drying said carbon black pellets;

the improvement which comprises

adding additional flocculent carbon black to the wet carbon black pellets formed;

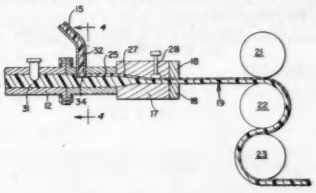
mixing the wet pellets formed and the added carbon black and forming wet carbon black pellets with a higher carbon black-to-water ratio than the respective ratio of the pellets to which the additional carbon black has not been previously added; and

thereafter recovering the wet carbon black pellets and drying them.

3,900,548
COEXTRUSION OF POLYSTYRENE AND POLYSULFONES

Donald F. Wiley, Big Spring, Tex., assignor to Cosden Oil & Chemical Company, Big Spring, Tex.

Filed Jan. 24, 1973, Ser. No. 326,240
Int. Cl.[2] B32B *27/30, 27/08*
U.S. Cl. 264—171 7 Claims



1. A process for the manufacture of composite sheeting having a major base layer of polystyrene and at least one relatively thin surface layer of polysulfone polymer adhered thereto, comprising extruding a heat plastified stream of polystyrene at a temperature of from about 440°F. to about 480°F., extruding a heat plastified stream of polysulfone polymer at a temperature of from about 540°F. to about 565°F., conveying said heat plastified stream of styrene polymer in a conduit having a generally circular cross-section, joining to the exterior surface of said styrene polymer stream within said conduit said heat plastified stream of polysulfone polymer, thereby forming a single stratified stream of heat plastified materials conforming to the cross-section of said conduit and being characterized by distinct, contiguous layers of said two polymeric materials having a relatively sharply defined interface therebetween, said interface terminating at each end at a point on the inside surface of said conduit, the relative volumetric proportion of the polysulfone polymer in said stratified stream being less than about 20 percent based upon the total polymeric material, and passing said stratified stream of heat plastified material through a sheet-form extrusion die, said die having a die orifice width substantially greater than the diameter of said conduit and having its die lips generally transversely aligned with said interface between the two polymeric materials.

3,900,549
METHOD OF SPINNING COMPOSITE FILAMENTS

Tadayuki Yamane, and Yutaka Hirano, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Okayama, Japan

Filed June 1, 1973, Ser. No. 366,095
Claims priority, application Japan, June 6, 1972, 47-56686
Int. Cl. D01d *5/08*
U.S. Cl. 264—176 F 7 Claims

1. A method of spinning composite filaments composed of a polyethylene and a polyester which comprises mixing a polyethylene having a melt index of above 27 but below 200 with a fiber-forming polyester having an intrinsic viscosity of 0.5 to 0.9 so that the following condition is satisfied:

the weight % of the polyethylene to the total weight of the mixture is in the range of 25 to 90 % and moreover the relationship

$$38 - 40v + \frac{1050}{w} \times 85v - \frac{1600}{w} + 48$$

is satisfied,

wherein x is the weight % of the polyethylene to the total weight of the mixture,

v is the intrinsic viscosity of the polyester, and

w is the melt index of the polyethylene;

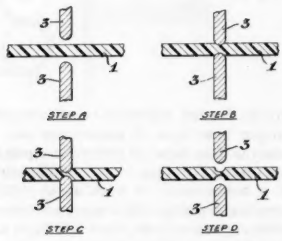
following which the resulting mixture is melt extruded from orifices of a spinneret; and thereafter the extruded filaments are withdrawn at a speed of above 2,500 meters per minute.

3,900,550

METHOD OF ENHANCING FLEXURE OF PLASTIC HINGES

Bruce L. Oliver, Midland, Mich., and Ben W. Heinemeyer, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 24, 1970, Ser. No. 31,690
Int. Cl. B29c *15/00*
U.S. Cl. 264—320 **9 Claims**



1. A method for providing plastic hinges having improved tensile strength and increased flex life which comprises compressing a groove-forming die into a normally solid, thermoplastic organic polymer at a compression rate less than about 2000 mils/second, the temperature of the polymer being below the softening point thereof.

3,900,551

SELECTIVE EXTRACTION OF METALS FROM ACIDIC URANIUM (VI) SOLUTIONS USING NEO-TRIDECANO-HYDROXAMIC ACID

Franco Bardoncelli, and Giuseppe Grossi, both of Rome, Italy, assignors to Comitato Nazionale per l'Energia Nucleare, Rome, Italy

Filed Mar. 2, 1972, Ser. No. 231,377
Claims priority, application Italy, Mar. 2, 1971, 48741/71
Int. Cl. B01d *11/04;* **C01g** *43/00*
U.S. Cl. 423—9 **2 Claims**

1. A process for purifying uranium from Pu(IV), Np(IV), Zr(IV), Nb(V), Fe(III), Ti(IV), V(V), Hf(IV), Ta(V), Po(IV), comprising

preparing an U(VI) aqueous solution containing said ions and acid by strong inorganic acids at a concentration in the range from 0.1 to 5 M;

removing from said solution all the nitrous acid therein contained by adding a nitrous acid suppressor selected from urea, hydrazine or hydroxylamine;

contacting said acid solution with a liquid organic phase comprising a water-immiscible organic solvent and neo-tridecano-hydroxamic acid to extract said metal ions into the organic phase; and

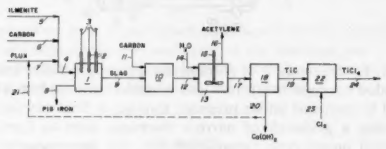
separating the resultant organic phase into which said elements are transferred from the aqueous phase in which the purified uranium is left.

3,900,552

PREPARATION OF HIGHLY PURE TITANIUM TETRACHLORIDE FROM PEROVSKITE OR TITANITE

Willard L. Hunter; Jack C. White, and William A. Stickney, all of Albany, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Division of Ser. No. 222,503, Feb. 1, 1972. This application Nov. 2, 1973, Ser. No. 412,222
Int. Cl.² C01G *23/02*
U.S. Cl. 423—76 **8 Claims**



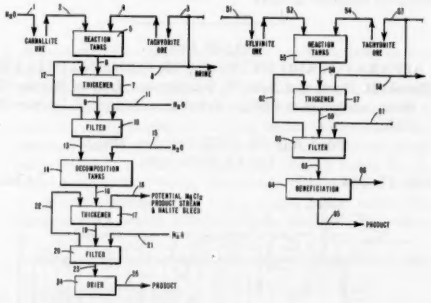
1. In a process for the production of titanium tetrachloride by the reaction of elemental chlorine with a titanium compound, the improvement comprising reacting a naturally occuring ore of titanium selected from the group consisting of perovskite and titanite with carbon at a temperature above about 1850°C but below the melting point of titanium carbide to form particles of titanium carbide within a calcium carbide matrix, separating the titanium carbide from the calcium carbide and thereafter reacting the titanium carbide with elemental chloride to produce titanium tetrachloride.

3,900,553

PROCESSING TACHYDRITE ORE

Alfred F. Nylander, 1736 Alemeda Ave., Redwood City, Calif. 94064

Filed May 14, 1973, Ser. No. 360,000
Int. Cl. C01d *3/08, 3/14;* **C01f** *5/30*
U.S. Cl. 423—184 **6 Claims**



1. A process which comprises:

1. forming a saturated aqueous solution of tachydrite ore;
2. forming an aqueous solution containing carnallite, sylvinite or mixtures thereof, saturated with respect to potassium chloride;
3. mixing said solutions in a mineral solution: tachydrite solution weight ratio of from about 1:0.5 to about 1:1.5 and at a temperature of from about 20°C to about 60°C whereby potassium chloride-containing solids are precipitated; and

4. beneficiating said potassium chloride-containing solids to provide potassium chloride.

3,900,554

METHOD FOR THE REDUCTION OF THE CONCENTRATION OF NO IN COMBUSTION EFFLUENTS USING AMMONIA

Richard K. Lyon, Fanwood, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 16, 1973, Ser. No. 341,919
Int. Cl. C01b *21/00*
U.S. Cl. 423—235 **34 Claims**

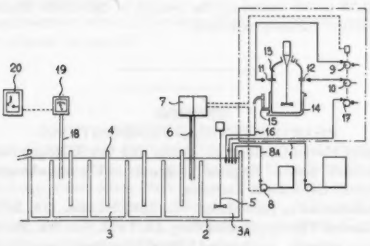
1. A process for selectively reducing NO in a combustion effluent, said process comprising the step of contacting an effluent stream containing NO in the presence of oxygen with a compound selected from the group consisting of ammonia, ammonium formate, ammonium oxalate, ammonium carbonate, and their aqueous solutions, said compound being present in an amount sufficient to provide an equivalent mole ratio of ammonia ranging from 0.4 to 10 moles per mole of NO, but not more than about 0.9 volume percent based on the total volume of said effluent stream, and in the presence of a reducing material in such a manner that the true temperature where said compound and said reducing material react with the NO containing combustion effluent ranges from 1300° to 2000°F., whereby the NO is selectively reduced, said reducing material being one selected from the group consisting of paraffinic, olefinic and aromatic hydrocarbons, oxygenated hydrocarbons, sulfonated hydrocarbons, carbon momoxide and hydrogen, but not in an amount more than about 2 volume percent based on the total volume of said combustion effluent and the amount of oxygen is at least enough to have some oxygen left after oxidation of said compound and said reducing material.

3,900,555

PROCESS FOR GENERATING AN OXIDIZING REAGENT FOR THE TREATMENT OF POLLUTED WATER

Eric Jourdan-Laforte, Ecully, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed July 19, 1973, Ser. No. 380,815
Claims priority, application France, July 28, 1972, 72.27359
Int. Cl.² C02B *1/34;* **C01B** *21/12*
U.S. Cl. 423—365 **6 Claims**



1. A process for obtaining monoperoxysulphuric acid from hydrogen peroxide and sulphuric acid and automatically controlling the content of oxidizable impurity in an aqueous medium by oxidizing the impurity with the monoperoxysulphuric acid, comprising:

simultaneously adding to a reaction vessel (1) hydrogen peroxide in the form of an aqueous solution with a concentration ranging from 35–100% and (2) concentrated sulphuric acid or fuming sulphuric acid;

maintaining the temperature in the reaction vessel in the range of −10° C to +80° C;

allowing the contents of the reaction vessel to overflow into the aqueous medium having oxidizable impurity therein;

monitoring the oxidizable impurity content of the aqueous medium downstream of the point of entry of said overflow into the aqueous medium; and

controlling the amount of reactants added in said adding step in response to the concentration of the oxidizable impurity monitored in said monitoring step;

whereby the supply of hydrogen peroxide and sulphuric acid to the reaction vessel is so controlled that the generation of monoperoxysulphuric acid occurs only when required and the quantity thereof produced is adjusted according to the quantity thereof required for reaction with said oxidizable impurity.

3,900,556

PROCESS FOR THE CONTINUOUS CARBONIZATION AND GRAPHITIZATION OF A STABILIZED ACRYLIC FIBROUS MATERIAL

Charles M. Clarke, Watchung, N.J., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 777,275, Nov. 20, 1968, abandoned. This application Apr. 17, 1972, Ser. No. 244,990
Int. Cl. C01b *31/07*
U.S. Cl. 423—447 **13 Claims**

1. A continuous process for the carbonization and graphitization of a stabilized acrylic fibrous material which is nonburning when subjected to an ordinary match flame and derived from an acrylic fibrous material selected from the group consisting of an acrylonitrile homopolymer and acrylonitrile copolymers which contain at least about 85 mol percent of acrylonitrile units and up to about 15 mol percent of one or more monovinyl units copolymerized therewith comprising continuously passing a continuous length of said fibrous material through a heating zone of a single induction furnace while said fibrous material is suspended within the confines of a hollow graphite susceptor which is inductively heated and provided with an inert gaseous atmosphere and a temperature gradient in which said fibrous material is initially raised from a temperature within the range of about 20° to about 500°C. within a period of about 3 seconds to about 10 minutes to a temperature within the range of about 900° to about 1600°C. where it is maintained for about 3 seconds to about 5 minutes to form a continuous length of carbonized fibrous material, and in which said carbonized fibrous material is subsequently raised to a temperature within the range of about 2400° to about 3100°C. to form a continuous length of graphitized fibrous material.

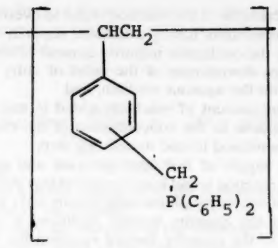
3,900,557

ANCHORED HOMOGENEOUS-TYPE CATALYSTS FOR H-D EXCHANGE

Graeme Gilroy Strathdee, Pinawa, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Canada

Filed July 16, 1973, Ser. No. 379,272
Claims priority, application Canada, July 19, 1972, 147481
Int. Cl.² B01J *11/00;* **C01B** *4/00, 5/02*
U.S. Cl. 423—580 **5 Claims**

1. A process for the catalyzed H-D exchange between hydrogen-containing gaseous streams and liquid water or alcohols characterized by the use therein of an anchored, transition metal catalyst prepared by reacting a diphenylphosphinomethylated polystyrene of the general formula:



with an homogeneous, transition metal catalyst complex in which the transition metal is selected from the group consisting of ruthenium, rhodium and iridium, said complex containing a ligand weaker than the $-P(C_6H_5)_2$ attached to the resin and displaceable thereby.

3,900,558

METHOD OF MEASURING HISTAMINE RELEASE FROM MAST CELLS

C. Richard Kinsolving, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 156,076, June 23, 1971, abandoned. This application Oct. 9, 1973, Ser. No. 404,446

Int. Cl. G01n *21/38, 31/22, 33/16*

U.S. Cl. 424—8 7 Claims

1. A method of determining the susceptibility of a subject to allergens which comprises the steps of incubating mast cells with serum of the subject at temperatures of 30° to 45°C., contacting the incubated mast cells with an allergen and thereafter adding a dilute solution of an absorbable fluorescent acridone to the allergen treated cells and measuring the acridone absorbed by the mast cells.

3,900,559

SUSTAINED RELEASE OF METHANTHELINE

James S. Y. Sim; Maurice H. Van Horn; Arthur I. Cohen; Stanley E. Gordesky, and Stanley I. Gordon, all of Rochester, N.Y., assignors to Union Corporation, Verona, Pa.

Filed Sept. 10, 1973, Ser. No. 395,668

Int. Cl.[2] H61K *27/12*

U.S. Cl. 424—22 16 Claims

1. A sustained release oral ingestion 26 hour methantheline eluting pharmaceutical composition consisting essentially of: A. a polymerized and cured matrix of about 104 parts of a polymerizable composition consisting essentially of:

1. polymerizable monoester of a member selected from the group consisting of acrylic acid, methacrylic acid, and mixtures thereof; and a polyhydric alcohol;
2. heterocyclic polymerizable compound containing a carbonyl functionality adjacent to the nitrogen in the heterocyclic ring and being selected from the group consisting of N-vinyl lactams, N-vinyl imidazolidone, N-vinyl succinimide, N-vinyl diglycolylimide, N-vinyl glutarimide, N-vinyl-3-morpholinone, N-vinyl-5-methyl-3-morpholinone, and mixtures thereof;
3. monoethylenically unsaturated esters selected from the group consisting of alkyl acrylates, alkyl methacrylates, vinyl esters of saturated monocarboxylic acids of up to 22 carbon atoms, and mixtures thereof, wherein the alkyl group of said methacrylate or acrylate contains from 1 to 22 carbon atoms; and
4. divinyl benzene; and

wherein the monomer mixture contains from about 75 to about 82 percent by weight of (1); from about 10 to about 15 percent by weight of (2); from about 1 to about 2 percent by weight of (3) and from about 0.1 to about 0.6 percent by weight of (4) based upon the total weight of (1), (2), (3), and (4) in the monomer mixture; in admixture with about 26 parts of finely divided absorptive siliceous, or calcareous inert filler and suspending aid for methantheline bromide;

B. said polymerized and cured matrix having been soaked for about 12 hours in an isotonic saline solution containing per 5 ml of isotonic saline solution at least about 100 mg of methantheline bromide in an amount at least sufficient for a total dosage requirement adapted to gradually elute, upon oral ingestion during 26 hours of a treatment period; and thereby entrapping the methantheline in said matrix.

3,900,560

SOLUTION COMPRISING A LACRYMATOR

Amnon Jacobson, Omri St. 22, Tel Aviv, Israel

Continuation-in-part of Ser. No. 259,217, June 2, 1972, abandoned. This application May 15, 1973, Ser. No. 360,509

Claims priority, application Israel, Apr. 23, 1972, 39273

Int. Cl.[2] A61K *9/00;* A61R *9/04;* A01N *9/06, 9/20*

U.S. Cl. 424—45 5 Claims

1. A process for conveying a lacrymator at least 4 feet in the form of a foam onto a surface which process comprises dissolving a lacrymator selected from the group consisting of o-chlorobenzal-malenonitrile and phenylacylchloride in a non-toxic, compatible surface active agent selected from the group consisting of an ethoxylated nonyl phenol, ethoxylated linear alcohol, sodium lauryl sulfate and ethoxylated alkylolamide or in a solution of said surface active agent in a small amount of water to form a non-foamable solution; mixing with said non-foamable solution a solvent for said non-foamable solution selected from the group consisting of water and a solution of a water-miscible organic solvent in water until a homogeneous mixture is obtained; introducing the foamable solution into an aerosol container along with a sufficient amount of a liquified gaseous propellant to enable the foamable solution to be ejected from said container when pressurized to a distance of at least 4 feet; and ejecting said foamable composition through a distance of at least 4 feet onto said surface in the form of a foam through an orifice of said container having a cross-sectional area of from 1 mm^2 to 80 mm^2 at a flow rate of 14-240 g/second while maintaining said composition at a temperature of from 0° to 120°F., the amount by weight of surface active agent being within the range of 4.5 to 29.7% based on weight of entire foamable composition minus propellant and the amount by weight of said lacrymator being from 0.05 to 3% based on the weight of the entire foamable composition minus propellant.

3,900,561

PHARMACEUTICAL COMPOSITIONS

Benjamin Davis, Chalfont St. Peter, and Derek Roger Pearce, Bracknell, both of England, assignors to Glaxo Laboratories Limited, Greenford, England

Continuation-in-part of Ser. No. 208,984, Dec. 16, 1971, abandoned. This application Nov. 20, 1972, Ser. No. 307,851

Claims priority, application United Kingdom, Dec. 17, 1970, 60069/70

Int. Cl.[2] A61K *17/00*

U.S. Cl. 424—238 14 Claims

1. An aqueous solution adapted for use in medicine to produce anaesthesia by intravenous injection, said solution consisting essentially of from 0.1–20% by weight of a steroidal anaesthetic having a solubility in water at 20°C of at least 1 mg/ml and from 0.1–50% by weight of a vein-damage reducing substance consisting of a parenterally acceptable non-ionic surface active component having an HLB value above 9 and not more than 30, whereby the physiological compatibility of said steroidal anaesthetic is improved.

3,900,562

ANTIBACTERIAL COMPOSITIONS AND METHODS

Florin Seng, Cologne-Buchheim; Kurt Ley, Odenthal-Globusch, and Georg Metzger, Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

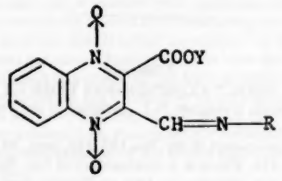
Division of Ser. No. 323,953, Jan. 15, 1973, which is a division of Ser. No. 130,007, March 31, 1971, Pat. No. 3,819,616. This application Aug. 16, 1973, Ser. No. 388,961

Claims priority, application Germany, Apr. 2, 1970, 2015676

Int. Cl. A611 *27/00*

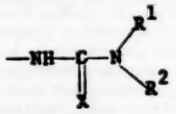
U.S. Cl. 424—248 30 Claims

1. An antibacterial composition which comprises an antibacterially effective amount of a compound of the formala



or a pharmaceutically acceptable non-toxic salt thereof wherein Y is hydrogen, an alkali metal cation or the cation R^5-NH_3; and

each of R and R^5 is



in which

X is O, S or NH, and

each of R^1 and R^2 when taken independently is identical to or different from the other, and is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms and hydroxyalkyl of 1 to 4 carbon atoms, or R^1 and R^2 together with the nitrogen atom to which they are attached, form a morpholino or S,S-dioxothiomorpholino ring,

in combination with a pharmaceutically acceptable non-toxic inert diluent or carrier.

3,900,563

METHOD OF USING 3-[2-(4-PHENYL-1-PIPERAZINYL)ETHYL]-INDOLINES

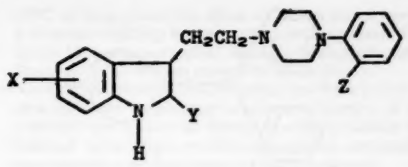
George Rodger Allen, Jr., Old Tappan, N.J.; Francis Joseph McEvoy, Pearl River, N.Y.; Vern Gordon De Vries, Ridgewood, N.J.; Daniel Bryan Moran, Suffern, N.Y., and Ruddy Littell, River Vale, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 371,201, June 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 147,700, May 27, 1971, Pat. No. 3,751,416. This application May 24, 1974, Ser. No. 473,029

Int. Cl.[2] A61K *27/00*

U.S. Cl. 424—250 10 Claims

1. A method for the therapeutic management of the manifestations of psychotic disorders, pyschoneurotic conditions, anxiety and tension in a warm-blooded animal which comprises administering orally or parenterally to said animal an antipsychotic or antipsychoneuritic or antianxiety amount of a compound of the formula:



wherein X is 5,6-dimethoxy or 5,6-methylenedioxy, Y is hydrogen or methyl, and Z is hydrogen or methoxy, with the proviso that when X is 5,6-dimethoxy and Z is methoxy, then Y must be methyl; or a pharmacologically acceptable acid-addition salt thereof.

3,900,564

OCOTEA ALKALOID FOR RELIEF OF ANXIETY

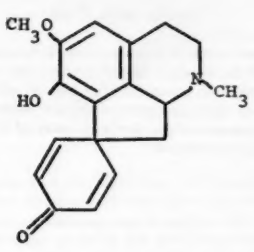
Giorgio Ferrari, 8 via Lario, Milan, and Cesare Casagrande, 13 via per Brunate, Como, both of Italy

Division of Ser. No. 78,766, Oct. 7, 1970, Pat. No. 3,711,485, which is a continuation-in-part of Ser. No. 676,054, Oct. 18, 1967, abandoned. This application Oct. 30, 1972, Ser. No. 301,841

Int. Cl. A61k *27/00*

U.S. Cl. 424—258 7 Claims

1. A therapeutic composition in dosage form for the relief of anxiety in humans comprising, as active principle, a therapeutic compound selected from the group consisting of the alkaloid glaziovine having the formula:



and non-toxic pharmaceutically acceptable acid addition salts thereof, and a physiologically compatible solid excipient, said composition providing said compound in a dose amount of from 10 mcg. to about 50 mg.

3,900,565

HYPOGLYCEMIC COMPOSITIONS CONTAINING BENZHYDRYLLACTAMIMIDE DERIVATIVES

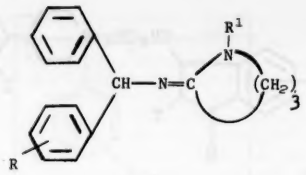
Johann Martin Griser, and Thomas R. Blohm, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 180,118, Sept. 13, 1971, Pat. No. 3,782,162. This application June 1, 1973, Ser. No. 366,105

Int. Cl. H61k *27/00*

U.S. Cl. 424—274 7 Claims

1. A method of inducing a hypoglycemic response in a hyperglycemic patient which comprises administering to said patient an effective hypoglycemic amount of a compound having the formula



wherein R is selected from hydrogen or lower alkoxy of from 1 to 6 carbon atoms; R^1 is selected from hydrogen or lower alkyl of from 1 to 4 carbon atoms; or a pharmaceutically acceptable acid addition salt of said compound.

3,900,566

PHARMACEUTICAL COMPOSITIONS CONTAINING THE TERT BUTYL ESTER OF N-[(1-CARBOXY-L-PROLYL)-OXY]-SUCCINIMIDE AND METHOD OF USE

Wilhelm Konz, Ingelheim am Rhein; Franz Waldeck, Mainz-Hechtsheim, and Hans-Michael Jennewein, Wiesbaden, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation of Ser. No. 330,182, Feb. 7, 1973, abandoned. This application Jan. 18, 1974, Ser. No. 434,674

Claims priority, application Germany, Feb. 14, 1972, 2206867

Int. Cl. A61k *27/00*

U.S. Cl. 424—274 **1 Claim**

1. A method for the treatment of gastric hypersecretion and ulceration of the stomach in a warm-blooded animal, which comprises perorally, parenterally or rectally administering to said animal an effective gastric secretion inhibiting or anti-ulcerogenic amount of the tert.butyl ester of N-[(1-carboxy-L-prolyl)-oxy]-succinimide.

3,900,567

ANTIBIOTIC SUBSTANCES

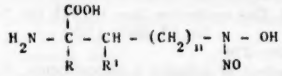
Giancarlo Lancini, Pavia; Ettore Lazzari, and Alberto Diena, both of Milan, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Division of Ser. No. 289,118, Sept. 14, 1972, Pat. No. 3,830,837, which is a continuation-in-part of Ser. No. 559,749, June 23, 1966, Pat. No. 3,823,186. This application Oct. 26, 1973, Ser. No. 410,197

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—319 **1 Claim**

1. Method of inhibiting fly reproduction which comprises supplying flies with a diet containing a sterilizing amount of a compound of the general formula



wherein R and R_1 are each hydrogen or a lower alkyl group, and n is an integer from 0 to 4.

3,900,568

1-CHLORO-1-METHYL-2,2,3,3-TETRAFLUOROCYCLOBUTANE FOR GENERAL INHALATION ANESTHETIC

Robert S. Holdsworth; Gerald J. O'Neill, both of Arlington; Charles W. Simons, Bedford, and Vincent L. DiBiasio, Billerica, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed July 26, 1974, Ser. No. 492,343

Int. Cl. A61k *27/00*

U.S. Cl. 424—352 **1 Claim**

1. The process of inducing anesthesia in a mammal, which comprises administering by inhalation to said mammal an effective quantity, to induce anesthesia, of 1-chloro-1-methyl-2,2,3,3,-tetrafluorocyclobutane.

3,900,569

DIRECT COMPRESSION VEHICLE

Anthony Monti, Irvington, N.Y., assignor to SuCrest Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 185,344, Sept. 30, 1971, Pat. No. 3,821,414, which is a continuation of Ser. No. 885,980, Dec. 17, 1969, abandoned. This application Sept. 15, 1972, Ser. No. 289,545

Int. Cl. A61j *3/10;* **A61k** *27/00*

U.S. Cl. 424—361 **4 Claims**

1. A particulate composition useful as a direct compression vehicle for forming tablets consisting essentially of a dry mixture of:

a. about 100 parts by weight of an intimate co-dried blend of a minor but effective portion of locust bean gum and a major portion of tricalcium phosphate;

b. up to about 200 parts of granular tricalcium phosphate;

c. locust bean gum as a lubricating agent and disintegrating agent in an amount of from about 1 to about 7 weight per cent, based upon said co-dried blend, and from about 3 to about 7 weight per cent, based upon the combined weight of said co-dried blend and granular tricalcium phosphate; and

d. a pharmaceutically-acceptable acidic material as an auxilliary disintegrating agent in an amount of from about 1 to about 7 weight per cent, based upon said co-dried blend, and from about 1 to about 3 weight per cent, based upon the combined weight of said co-dried blend and granular tricalcium phosphate.

3,900,570

FERMENTATION ADJUVANT FOR YEAST LEAVENED BREAD PROCESSES

Edward A. Stigler, Palos Heights, Ill., assignor to Walter M. Christensen, Milwaukee, Wis., a part interest

Continuation-in-part of Ser. No. 185,445, Sept. 30, 1971, abandoned. This application Oct. 23, 1973, Ser. No. 408,551

Int. Cl.[2] A21D *2/02, 2/04, 2/16, 2/22*

U.S. Cl. 426—9 **16 Claims**

1. An adjuvant for addition to a yeast leavened dough mixture, which adjuvant permits a substantial reduction in the fermentation time of the dough mixture, comprising a dry blended mixture including 0.025 to 10 weight % of an ammonium salt capable of acting as a yeast nutrient, 0.001 to 0.75 weight % of an oxidizing agent selected from the group consisting of potassium bromate, potassium iodate, calcium bromate, calcium iodate, ammonium persulfate, L-ascorbic acid, azocarbonamide and mixtures thereof, and 10 to 90 weight % of a glyceride emulsifying agent capable of at least partially encapsulating said yeast nutrient and said oxidizing agent when dry blended therewith.

3,900,571

PROCESSING OF FRUIT WITHOUT EXPOSURE TO AIR

Wallace J. S. Johnson, Berkeley, Calif., assignor to Up-Right, Inc., Berkeley, Calif.

Filed Sept. 24, 1971, Ser. No. 183,334
Int. Cl.[2] C12G *1/00*; A23B *7/00*
U.S. Cl. 426—15 21 Claims

1. A process for handling fruit, comprising:
a. harvesting fruit in the field,
b. surrounding the harvested fruit with an inert gas atmosphere while said harvested fruit is in the field,
c. transporting the harvested fruit from the field to a fruit-processing plant,
d. discharging the harvested fruit at the fruitprocessing plant into an enclosed receptacle,
e. maintaining said harvested fruit in an inert gas atmosphere and out of contact with oxidizing air in said enclosed receptacle at said fruit-processing plant and at all times from the time it is first surrounded in the field with said inert gas atmosphere until it has been discharged into the enclosed receptacle at the fruit-processing plant.

15. In a process for the conversion of harvested grapes into wine which utilizes a plurality of processing and storage containers interconnected for flow from one container to the next and in which fermentation of the grapes takes place in one of said containers:
a. maintaining a layer of inert gas in contact with the contents of each container to prevent contact of said contents with oxidizing air,
b. supplying inert gas under pressure to one of said containers and forcing the contents therein to flow to another container having a lower pressure therein
c. collecting CO_2 has generated during the fermentation of the grapes and utilizing said gas as said inert gas.

3,900,572

NUTRIENT COMPOSITION FOR PLANTS AND ANIMALS

Herbert R. Peer, Storm Lake, Iowa, assignor to Ferma-Gro Corporation, Storm Lake, Iowa

Filed Mar. 20, 1974, Ser. No. 453,177
Int. Cl. A23c *9/12*
U.S. Cl. 426—41 11 Claims

1. A nutrient composition for plants and animals which comprises a cultured whey product inoculated with *Lactobacillus* organisms and fermented in the presence of kelp extract the organism density of said *Lactobacillus* organisms being at least one billion per milliliter when said kelp extract is added and the concentration of said extract during fermentation being 25 to 35 percent solubles, said composition having been maintained at fermenting conditions until the organism density is within the range of from 1.5 billion to about 2.0 billion per milliliter, and the pH of said composition is 4.3 or less.

3,900,573

PROCESS FOR MAKING RETORT STABLE SIMULATED MEAT PRODUCTS

James A. Freck, Park Forest South; Dale H. O'Rell, and Leonard V. Kondrot, both of Chicago, all of Ill., assignors to American Maize Products Company, New York, N.Y.

Filed Feb. 19, 1974, Ser. No. 443,438
Int. Cl. A23j *3/00*
U.S. Cl. 426—274 8 Claims

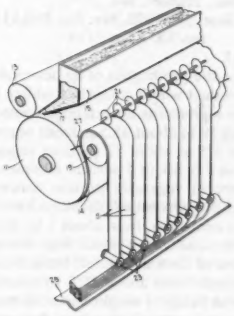
1. A process for preparing a retort stable food product comprising:
a. admixing in aqueous solution a blend comprising a plurality of pieces of edible protein material having a protein content of at least about 15% and from about 10 to about 1,000% by weight of protein material of an inhibited starch material selected from the group consisting of corn starch having a Granular Swelling Power at 95°C. of from about 5 to about 15, waxy corn starch having a Granular Swelling Power at 95°C. of from about 5 to about 25, sorghum starch having a Granular Swelling Power at 95°C. of from about 5 to about 15, wheat starch having a Granular Swelling Power at 95°C. of from about 5 to about 15, and tapioca starch having a Granular Swelling Power at 95°C. of from about 5 to about 25;
b. cooking the blend at a temperature and for a period of time sufficient to gelatinize a substantial portion of the inhibited starch material without appreciable loss in nutritional value of the protein and without appreciable decomposition or degradation of the protein; and
c. cooling the cooked product;
d. whereby a retort stable integral product comprising the piece of protein material bound together with inhibited starch material is obtained.

3,900,574

TREATMENT OF CHEESE SLICES TO PREVENT STICKING TOGETHER

Leonard A. Warwick, Niles, Ill., assignor to Kraftco Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 141,050, April 29, 1971, abandoned. This application Oct. 3, 1973, Ser. No. 402,892
Int. Cl. A23c *19/00*, *19/02*, *19/14*
U.S. Cl. 426—274 2 Claims



1. In a method for the high-speed, continuous preparation of cheese slices which includes the steps of forming the cheese into a sheet on a chilled conveying surface, slitting the cheese sheet into ribbons, stacking the ribbons to form a strip of stacked ribbons and transversely cutting the strip of stacked ribbons to form a stack of cheese slices, the improvement comprising providing an aqueous dispersion of a hydrocolloid, said hydrocolloid being present in said hydrocolloid dispersion at a level of from about two to about five percent by weight of the dispersion, heating said aqueous hydrocolloid dispersion to a temperature of from about 160°F to about 200°F for a period of time of at least about 30 minutes at the lower temperature to at least about 5 minutes at the higher temperature and at least intermediate periods of time at intermediate temperatures so as to effect pasteurization of the dispersion, and spraying said aqueous hydrocolloid dispersion onto at least one surface of said cheese sheet or said cheese ribbons prior to stacking said cheese ribbons, so as to provide a thin film of said hydrocolloid interposed between the cheese slices stacked in face-to-face relationship in said stack at a level of from about 0.01 to about 1.0 grams per square foot of surface of said cheese slices, whereby said cheese slices may be subsequently easily separated one from another, said hydrocolloid being selected from the group consisting of edible food starch and mixtures of edible food starch and a gum selected from the group consisting of guar gum, carob bean gum, gum tragacanth, gum karaya, carrageenan, alginate, and carboxymethyl cellulose, said starch being present in said mixture at a level of at least about fifty percent by weight.

3,900,575

PREPARATION OF COATED HAMS

Joseph Rapoport, Montreal, Canada, assignor to Hygrade Foods Inc., Montreal, Canada

Filed Aug. 6, 1974, Ser. No. 495,277
Int. Cl. A22c *18/00*; A23b *1/00*
U.S. Cl. 426—305 6 Claims

1. A method of preparing ham which comprises deboning, trimming, curing and defatting a ham; pressing and molding the ham into a container; cooking the ham in said container; removing the cooked ham from said container; applying to all surfaces of the cooked ham a viscous caramel liquid; and deep-fat frying the caramel coated ham at a temperature of 350°F. –400°F. for about 30 seconds to 3 minutes to produce an adherent and uniform rich brown coating thereon.

3,900,576

MEAT EMULSION EXTENDER PROCESS

Arthur August Schulz, Columbus, Ohio, assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sept. 18, 1972, Ser. No. 290,115
Int. Cl. A22c *11/00*
U.S. Cl. 426—311 8 Claims

1. A process for the production of an acceptable extended meat emulsion product which comprises adding to a mixture of meat emulsion ingredients an extender composition comprising from about 39 to about 48.5 percent vegetable protein fiber, from about 5.5 to about 12 percent vegetable protein isolate, from about 2 to about 5 percent albumen, from about 0 to about 6 percent vegetable protein concentrate, from about 4.5 to about 5.5 percent edible whey, from about 0.1 to about 1.5 percent emulsifier, from about 1 to about 5 percent non-fat dried milk solids, from about 9 to about 18 percent gluten or a mixture of flour and water, from about 0 to about 1.5 percent salt, and from about 15.5 to about 19 percent water, said percents being by weight based on the total weight of the extender composition, blending the meat emulsion ingredients and the extender composition to form an extended meat emulsion, and then heating the extended meat emulsion to form the finished product.

3,900,577

METHOD FOR PREPARING EXPANDED DRY GELS

Gerhard J. Haas, Woodcliff Lake, N.J., assignor to General Foods Corporation, White Plains, N.Y.

Filed Aug. 16, 1971, Ser. No. 172,315
Int. Cl. A23g *3/00*
U.S. Cl. 426—312 6 Claims

1. A method of producing expanded, dried gels comprising the steps of:

a. contacting a gelled material with a gas at a pressure of greater than about 50 p.s.i.g. for a period of time sufficient to enable the gas to diffuse into the gel, said gas being selected from the group consisting of nitrogen, air, carbon monoxide, fluorinated hydrocarbons, ethane, propane, ethylene, neon and argon;

b. completely freezing the gelled material at a temperature below about −10°C while still under said pressure;

c. releasing the said pressure on the frozen gelled material; and

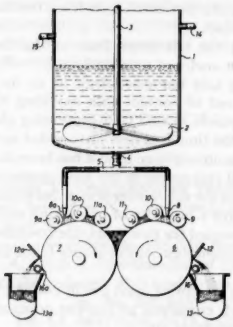
d. drying the gel.

3,900,578

PROCESS FOR PREPARING SO CALLED CRUMB FOR THE MANUFACTURE OF MILK CHOCOLATE

Sandor Turos, Stockholm, Sweden, assignor to Semper AB, Stockholm, Sweden

Filed July 30, 1973, Ser. No. 383,561
Claims priority, application Sweden, Aug. 18, 1972, 10811/72
Int. Cl. A23c *1/00*
U.S. Cl. 426—580 18 Claims



1. A process for the preparation of crumb for use in the manufacture of chocolate products which comprises admixing first and second streams of reactant materials to form a mixture thereof, feeding said mixture onto a heating means, and concentrating the heat treating said mixture to cause a Maillard reaction between said reactant materials;

said first stream comprising a milk concentrate based upon whole milk or milk having decreased fat content, said milk concentrate having a dry solids content of about 20 to 70% by weight; and

said second stream comprising an aqueous solution or suspension containing one or more amino acids reactive with said milk concentrate of said first stream in the Maillard reaction, said amino acid or acids present in an amount from 0.1 to 4% by weight based on the dry milk solids content of said first stream.

3,900,579

LOW-TEMPERATURE-PULVERIZED ANIMAL FOODS

Yoshikazu Masuda, Kobe, and Tatsumi Inagaki, Kyoto, both of Japan, assignors to Sun Spice Co., Ltd., Japan

Filed Aug. 20, 1973, Ser. No. 389,991
Claims priority, application Japan, Aug. 22, 1972, 47-83889
Int. Cl.[2] A23L *1/31*
U.S. Cl. 426—388 12 Claims

1. A nutritious hygenic powdery animal food suitable for human consumption which is obtained without noticeable propagation of saprogenic bacteria by pulverising to a fine powder at a temperature of −20° to −120°C at least one material selected from the group consisting of bones, cartilage portions, tendons and flesh-bearing bones of animals.

3,900,580

METHOD OF REMOVING CRUMBS FROM COOKING OIL

Weldon C. Boggs, Tampa, Fla., assignor to Food Research & Equipment Co., Tampa, Fla.

Division of Ser. No. 115,031, Feb. 12, 1971, Pat. No. 3,701,313. This application Sept. 11, 1972, Ser. No. 288,073
Int. Cl. B01d *43/00*
U.S. Cl. 426—417 5 Claims

1. The method of removing crumbs from the cooking oil of a fryer unit having a cooking zone, comprising the steps of:

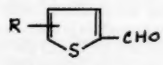
maintaining a body of crumb-containing cooking oil in the cooking zone at a cooking temperature; diverting at least a portion of the crumbs in the cooking oil to another zone containing a body of entrapped cooking oil at a temperature substantially lower than that in said cooking zone; and removing the crumbs from the entrapped body of oil in said zone of lower temperature by passing a moving element through the entrapped body of cooking oil in the zone of lower temperature.

3,900,581
FLAVORING AGENT

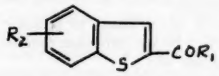
Max Winter, Geneva; Fritz Gautschi, Vaud; Ivon Flament; Max Stoll, both of Geneva, all of Switzerland, and Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 243,866, April 13, 1972, which is a division of Ser. No. 70,560, Sept. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, April 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, April 30, 1965, abandoned. This application June 24, 1974, Ser. No. 482,693
Int. Cl. A23l *1/26*
U.S. Cl. 426—535 **40 Claims**

1. As a new composition of matter a soluble coffee material having added thereto a minor, but flavor-modifying amount of a compound selected from the group of compounds having the general formulae:



wherein R is hydrogen, or an alkyl or thenyl group; and



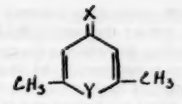
wherein R_1 and R_2 are hydrogen or alkyl.

3,900,582
FLAVORING AGENT

Max Winter, Geneva; Fritz Gautschi, Vaud; Ivon Flament; Max Stoll, both of Geneva, all of Switzerland, and Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 243,866, April 13, 1972, which is a division of Ser. No. 70,560, Sept. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, April 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, April 30, 1965, abandoned. This application June 24, 1974, Ser. No. 482,818
Int. Cl. A23l *1/26*
U.S. Cl. 426—535 **16 Claims**

1. A composition selected from the group consisting of foodstuffs and beverages to which has been added an effective, flavor improving amount of a pyrone of the formula:

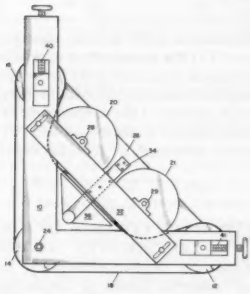


wherein each of the symbols X and Y represents oxygen or sulfur.

3,900,583
CONTOURED BELT COATING METHOD

David R. Terry, Wayne, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 170,534, Aug. 10, 1971, abandoned. This application Aug. 6, 1973, Ser. No. 385,789
Int. Cl. B05c *3/04, 3/08*
U.S. Cl. 427—3 **1 Claim**



1. A process for coating pharmaceutical tablets which comprises:

a. placing a charge of tablets on the upper surface and in the concave region of a contoured, concave, flexible, belt conveyor between two side retainer plates;

b. driving said belt conveyor in the direction of an inclined plane created by plural idler sprocket wheels disposed at each side and within the contoured region of said continuous belt conveyor, thereby forming a tumbling bed of said tablets;

c. spraying a coating material upon said tumbling bed of tablets, while simultaneously exhausting volatile matter, dust and particle fines while drying said coating material as a film on said tablets and drawing additional coating material in conjunction with dry air through the tumbling tablet bed; and

d. discharging the coated tablets from said belt conveyor by decreasing the slope of said inclined plane sufficiently to permit said tablets to exit the region of contour of said belt conveyor in the direction of the original belt conveyor travel.

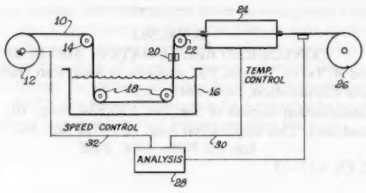
3,900,584
METHOD FOR ANALYSIS OF TREATED GLASS FIBERS

Klaus D. Rosinski, Granville, and John W. Schroer, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 13, 1972, Ser. No. 306,267
Int. Cl. C03c *25/02;* **G01n** *31/12*
U.S. Cl. 427—8 **9 Claims**

1. In a method for the treatment of glass fibers wherein the glass fibers are coated with a heat-curable polymeric material containing, when cured, water-soluble carbon material and the coated glass fibers are passed through an oven and heated to an elevated temperature at high speed to cure the polymeric material, the improvement comprising selecting a sample of the coated glass fibers having a cured coating, contact-

ing the sample with water at an elevated temperature for a time sufficient to extract the water-soluble carbon material from the cured coating, determining the carbon content of the resulting extract as a measure of the degree of cure of the coating and adjusting at least one of (1) the temperature to which the coated fibers are heated and (2) the speed, in response to the carbon content of the aqueous extract whereby at least one of (1) the temperature to which the coated glass fibers are heated is increased and (2) the speed of the coated fibers through the oven is decreased, to increase the degree of cure or at least one of (1) the temperature to which the coated glass fibers are heated is decreased and (2) the speed of the coated fibers is increased, to decrease the rate of cure.



3,900,585

METHOD FOR CONTROL OF IONIZATION ELECTROSTATIC PLATING

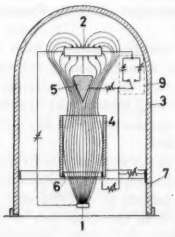
Kiyoshi Matsubara, Higashi-Murayama, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Feb. 12, 1973, Ser. No. 331,494

Claims priority, application Japan, Feb. 12, 1972, 47-15006; June 7, 1972, 47-56761; June 21, 1972, 47-62067; June 21, 1972, 47-62068; June 21, 1972, 47-62069

Int. Cl. C23c *11/02*

U.S. Cl. 427—13 **7 Claims**



1. In an ionization electrostatic plating method wherein a DC electric potential is applied in the atmosphere of a rare gas between an anode which is a boat containing a coating material and a cathode which is an article subjected to plating so that glow discharge is generated and then the coating material in the boat is vaporized and the vaporized coating material is deposited on the article, the improvement comprising focusing the electric lines of force occurring in the electric field between said two electrodes by means of a focusing tube, and thereafter dispersing the electric field by means of a dispersing torpedo additionally disposed between the two electrodes, the vaporized gas being ionized and the ionized particles being caused to flow along said electric lines of force and to settle fast on the article.

3,900,586

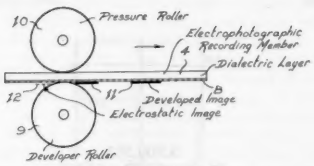
ELECTROSTATIC DUPLICATING PROCESS

Robert J. Wright, Tranmere, Australia, assignor to Research Laboratories of Australia Pty. Limited, Eastwood, Australia

Filed Dec. 20, 1972, Ser. No. 316,754

Int. Cl. G03g *13/08, 13/10, 13/22*

U.S. Cl. 427—19 **2 Claims**



1. An electrostatic duplicating process consisting essentially of the following steps:

a. collating a paper substrate as a receptor sheet with a paper substrate as transfer sheet, said transfer sheet comprising a backing and transferable coating material on one surface thereon, the transferable coating consisting essentially of a wax material containing conductive particles having a preselected electrical conductivity character;

b. transferring by pressure transfer part of said transferable coating material to said receptor surface to thereby form electrical conductivity differences between image and background areas on said receptor sheet contacting surface;

c. separating said sheets;

d. contacting the thus imaged surface of the receptor sheet so formed as a master with the dielectric surface of a dielectric recording member simultaneous with application of an electric field therethrough to produce an electrostatic latent image on said dielectric surface of the recording member in accordance with electrical conductivity differences of said receptor sheet master;

e. separating said receptor sheet master and said dielectric recording member;

f. developing said latent image to produce a copy on said dielectric surface by the attraction thereto of electroscopic marking particles; and

g. re-using the receptor sheet master in steps (d) and (e) for at least one additional copy under step (f).

3,900,587

IMAGING PROCESS EMPLOYING TREATED CARRIER PARTICLES

Myron James Lenhard, and Joseph Mammino, both of Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 218,014, Jan. 14, 1972. This application Jan. 7, 1974, Ser. No. 431,279

Int. Cl. G03g *13/08*

U.S. Cl. 427—19 **5 Claims**

1. An electrostatographic imaging process comprising the steps of forming an electrostatic latent image on an imaging surface and developing said electrostatic latent image by contacting said electrostatic latent image with an electrostatographic developer mixture comprising finely divided toner particles electrostatically clinging to the surface of larger, dye-treated carrier particles, said carrier particles comprising solid metallic particles selected from the group consisting of metals, metal alloys, metal compounds, and mixtures thereof coated with an adsorbed layer of an organic dye wherein said dye-treated carrier particles are characterized as being resistant to fluctuations in triboelectric properties, whereby at least a portion of said finely divided toner particles are attracted to and held on said imaging surface in conformance to said electrostatic latent image.

3,900,588
NON-FILMING DUAL ADDITIVE DEVELOPER

Donald J. Fisher, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 25, 1974, Ser. No. 445,389
Int. Cl. G03g *9/02, 13/08*
U.S. Cl. 427—19 **5 Claims**

1. An imaging process comprising the steps of:

a. forming an electrostatic latent image on an imaging surface;

b. developing said latent image by bringing an electrostatographic developing mixture within the influence of said latent image, said developing mixture comprising particles, said particles including (1) finely divided electroscopic toner material, (2) a minor portion, based upon the weight of said toner material of a stable, tough, substantially smearless, polymeric additive having an average particle size less than about the average particle size of said finely divided toner material, and (3) a minor proportion based on the weight of said toner material of a finely divided, nonsmearable, abrasive material of a hardness greater than said polymeric additive and toner materials;

c. removing the residual developed image from said imaging surface by a force which causes the toner, polymeric additive and abrasive materials of said developing mixture to be wiped across at least a portion of said imaging surface; and

d. repeating the process sequence at least one additional time.

3,900,589
ELECTROSTATOGRAPHIC IMAGING PROCESS

Nero R. Lindblad, Palmyra; Gordon E. Johnson, Webster, and James H. Sharp, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 277,542, Aug. 3, 1972. This application June 19, 1974, Ser. No. 480,782
Int. Cl. G03g *13/08*
U.S. Cl. 427—19 **2 Claims**

1. An imaging process comprising the steps of:

a. forming an electrostatic latent image on an imaging surface;

b. developing said latent image by bringing an electrostatographic developing mixture within the influence of said latent image, said developing mixture comprising particles, said particles including (1) finely divided electroscopic toner material and (2) a minor proportion based on the weight of said toner material of at least one finely divided, solid additive compound selected from the group consisting of phthalic acid, isophthalic acid, terephthalic acid, the metal and ammonium salts thereof;

c. removing at least a portion of at least any residual developed image from said imaging surface; and

d. repeating the process in sequence at least one additional time.

3,900,590
XEROGRAPHIC FUSING APPARATUS

Prafulla S. Dhoble, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 559,852, June 23, 1966, abandoned. This application Apr. 11, 1974, Ser. No. 459,863
Int. Cl. G03g *13/20, 15/20*
U.S. Cl. 427—22 **15 Claims**

1. Apparatus to heat fix a xerographic toner powder image to a final support material including

means to place a toner powder image on a final support material,

means to immerse the image bearing support material in a bath of liquid metal such that the metal exerts a pressure on the toner image to support the toner in image configuration, and

means to maintain the temperature of the liquid metal at a level sufficient to uniformly heat the toner powder image to the image fixing temperature and below the temperature at which the support material is damaged.

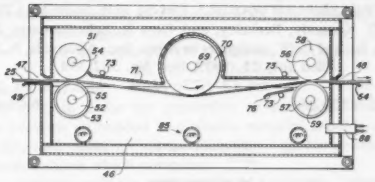
3. A method of heat fixing a heat fusible toner image to a final support material including

electrostatically placing a toner image on the final support material wherein toner particles are loosely bonded to said support surface in a raised image configuration,

providing a bath of hot highly dense liquid metal,

maintaining said bath at a temperature at which the toner image is fixed and below a temperature at which the support material is damaged,

moving said image bearing support material below the surface of said bath wherein the dense hot metal exerts a pressure



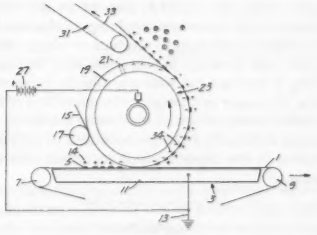
over the entire surface of said image to uniformly heat said image to the fusing temperature.

15. In the process of making an electrostatically produced copy wherein thermo-responsive particulate material is arranged in a predetermined pattern on a support member, the improvement comprising contacting the support member with a body of liquid sufficient in size and heat content to effect a thermal fixing of said thermo-responsive particulate material without degrading said support member or said thermo-responsive particulate material, and maintaining said contact for a time sufficient to thermally fix said thermo-responsive material to said support member.

3,900,591
DEVELOPED IMAGE TRANSFER

Robert J. Kline, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 8, 1973, Ser. No. 368,108
Int. Cl. G03g *13/08*
U.S. Cl. 427—24 **4 Claims**



1. A process comprising:

1. providing contact between a first surface of a web and a transfer member, said transfer member comprising an apertured, electrically conductive support member and a surface layer in the form of a pile fabric having a multiplicity of electrically conductive fibrous loops,

2. vacuum drawings said first surface of said web into intimate contact with said electrically conductive loops whereby said web is stationary relative to said transfer member,

3. contacting a second surface of said web opposing said first surface of said web with a carrier surface bearing particles disposed in a predetermined pattern thereon, said particles having electrical charges of one polarity associated therewith,

4. providing an electrical potential difference between said transfer member and said carrier surface whereby said web acquires an electrical charge of opposite polarity to said one polarity, and
5. separating said web from said carrier surface whereby said particles transfer to said second surface of said web with retention of said predetermined pattern.

3,900,592

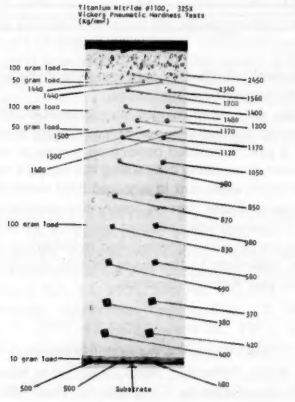
METHOD FOR COATING A SUBSTRATE TO PROVIDE A TITANIUM OR ZIRCONIUM NITRIDE OR CARBIDE DEPOSIT HAVING A HARDNESS GRADIENT WHICH INCREASES OUTWARDLY FROM THE SUBSTRATE

Kurt D. Kennedy, Berkeley, and Glen R. Scheuermann, Novato, both of Calif., assignors to Airco, Inc., Montvale, N.J.

Filed July 25, 1973, Ser. No. 382,308

Int. Cl. C23c *11/08*

U.S. Cl. 427—39 **6 Claims**



1. A method for coating a substrate with a nitride or carbide of titanium or zirconium, comprising, placing the substrate in an evacuated environment, evaporating titanium or zirconium from a crucible in the evacuated environment to produce a vapor and causing the vapor to deposit on the substrate initially as titanium or zirconium, applying an electrical potential during deposition sufficient to produce a voltage difference of at least 200 volts between the substrate and the crucible, and introducing a reactant gas with a gradually increasing partial pressure to the vapor to change the composition of the deposit from its initial composition to increasing nitride or carbide in the direction outwardly from the substrate to produce a hardness gradient in the deposit which increases outwardly from the substrate.

3,900,593

METHOD OF PRODUCING MAGNETIC METAL OXIDE FILMS BONDED TO A SUBSTRATE

Andrew Herczog, Painted Post; Margaret M. Layton, and Dale W. Rice, both of Horseheads, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed June 16, 1972, Ser. No. 263,586

Int. Cl. H01f *10/00*

U.S. Cl. 427—53 **22 Claims**

1. A method of forming a magnetic film device comprising the steps of

providing an inorganic, non-magnetic substrate,

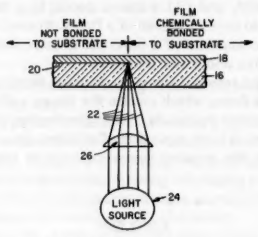
applying to said substrate a coating of a magnetic metal oxide powder dispersed in a liquid vehicle,

heating said substrate and applied coating to a temperature corresponding to at least the vaporizing temperature of said liquid to volatilize said liquid and leave a film of magnetic metal oxide powder on said substrate, and

bonding said film of magnetic metal oxide to said substrate by further heating at least the interface between said film and said substrate to a temperature up to the lower of the softening or sintering temperature of the substrate and film materials for a time sufficient for said film itself to chemically bond to said substate.

22. A method of forming a magnetic recording and storage device comprising the steps of

providing a substrate formed of an ion-exchange strengthened glass,



applying to said substrate by silk screening a coating of a magnetic metal oxide powder selected from the group consisting of magnetite and gamma ferric oxide, said powder being dispersed in screening oil,

heating said substrate and applied coating to the annealing point of said substrate to volatilize said screening oil leaving a film of magnetic metal oxide powder on said substrate, and thereafter

bonding said film of magnetic metal oxide to said substrate by further heating the interface between said film and said substrate to the softening point of said glass by focusing light through said substrate on said interface for a time sufficient for said film itself to chemically bond to said substrate, said substrate being substantially transparent to said light.

3,900,594

PHOTOCURABLE TRIAZINE CONTAINING POLYENE-POLYTHIOL LACQUER COMPOSITION

James L. Guthrie, Ashton, and Francis J. Rendulic, Ellicott City, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

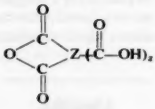
Continuation-in-part of Ser. No. 209,369, Dec. 17, 1971, Pat. No. 3,787,303. This application Oct. 25, 1973, Ser. No. 409,615

Int. Cl. B01j *1/10, 1/12*

U.S. Cl. 427—53 **6 Claims**

1. A photocurable lacquer composition comprising (A) a polythiol component containing at least 2 —SH groups per molecule; (B) 2,4,6-tris (allyloxy)s-triazine as polyene; the mole ratio of ene to thiol being from about 0.2:1 to about 5:1; (C) from about 0.0005 to about 50 percent by weight of the composition of a photocuring rate accelerator component; (D) from 1 to about 50 parts by weight per 100 parts by weight of the polyenepolythiol combination of a normally solid, solvent soluble polyester component having a molecular weight from about 500 to about 100,000 prepared by reacting (i) a polybasic acid having the general formula

where R_4 is a saturated or unsaturated hydrocarbyl group having valence of x and from 2 to about 21 carbon atoms and x is at least 2 or (ii) a polybasic acid anhydride having the general formula



where z is 0 or 1, Z is a saturated or unsaturated hydrocarbyl group having from about 2 to about 12 carbon atoms and a valence of 2 when z is 0 and a valence of 3 when z is 1 with (iii) a polyhydric alcohol having the general formula $[R_5](OH)_y$ where R_5 is a saturated or unsaturated hydrocarbyl or oxyhydrocarbyl group having a valence of y and from 2 to about 30 carbon atoms and y is at least 2.

3,900,595

METHOD OF MAKING WIPING CYLINDER OF STEEL ENGRAVING PRINTING PRESS

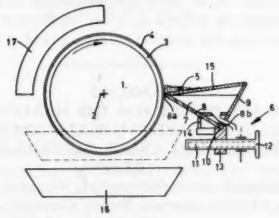
Gualtiero Giori, Lausanne, Switzerland, assignor to De la Rue Giori S.A., Switzerland

Division of Ser. No. 175,224, Aug. 26, 1971, Pat. No. 3,785,286, which is a continuation-in-part of Ser. No. 833,622, June 16, 1969, abandoned, and a continuation-in-part of Ser. No. 462,355, June 8, 1965, abandoned. This application Oct. 24, 1973, Ser. No. 409,265

Claims priority, application Italy, June 18, 1964, 48397/64

Int. Cl. B32b *31/22*

U.S. Cl. 427—55 **20 Claims**



1. A method of making a wiping cylinder of a steel engraving press which comprises providing a base cylinder, covering said base cylinder with a thin layer of rubber, providing a first homogeneous mixture composed of **100** parts by weight of polyvinyl chloride, **30–50** parts by weight of dioctylphthalate, **30–50** parts by weight of tricresylphosphate and **0.5** to **3** parts by weight of a stabilizer; providing a second homogeneous mixture composed of **100** parts by weight of polyvinyl chloride, **25–40** parts by weight of dioctylphthalate, **15–30** parts by weight of tricresylphosphate, **3–10** parts by weight of $CaCO_3$, **2–5** parts by weight of graphite and **0.5–3** parts by weight of a stabilizer; initially coating said rubber covering with an initial seamless layer of said first homogeneous mixture having a uniform thickness of from **0.3** to **1** mm; then coating said layer with a plurality of intermediate seamless layers each composed of one of said first and second homogeneous mixtures and each having a uniform thickness of from **0.3** to **1** mm. until a composite coating including said first mentioned layer having a uniform total thickness of from **2** to **3.5** mm. is obtained; and finally coating said composite coating with a final seamless layer of said second homogeneous mixture having a uniform thickness of from **0.3** to **1** mm to provide a smooth cylindrical surface precisely concentric with the axis of rotation of said wiping cylinder, each of said layers being heat hardened before an overlying layer is applied, said layers of said first mixture being hardened in situ to a hardness of approximately Shore **A 60** to **70** and said final layer being hardened in situ to a hardness of approximately Shore **A 80** to **95.**

3,900,596

METHOD OF PROTECTING EMBEDDED ELECTRONIC COMPONENTS

S. Yen Lee, Upper Marlboro, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 27, 1973, Ser. No. 401,313

Int. Cl.² C09D *3/68*

U.S. Cl. 427—58 **9 Claims**

1. A method for the protection of embedded electronic components embedded in a plastic material capable of protecting said electronic components from high temperature and physical shock which comprises

a. applying onto the surface of said electronic components a highly solvent resistant poly(butylene terephthalate) in an amount sufficient to provide a continuous coating on said electronic components, wherein

1. said continuous coating has a thickness of from about 2 to 6 mils and
2. said poly(butylene terephthalate) is applied in an organic solvent solution of 2 to 20 weight percent poly(-butylene terephthalate) in said solution, and

b. drying said continuous coating.

3,900,597

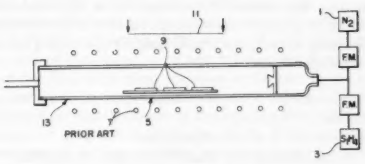
SYSTEM AND PROCESS FOR DEPOSITION OF POLYCRYSTALLINE SILICON WITH SILANE IN VACUUM

Jerry L. Chruma, and Paul G. Hilton, both of Phoenix, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Dec. 19, 1973, Ser. No. 426,396

Int. Cl. C23c *11/00*

U.S. Cl. 427—82 **13 Claims**



1. In a method for depositing polycrystalline silicon material onto a wafer from a gaseous silicon source flowing through a furnace tube, and the furnace is provided with heating means, and is further provided with a first end through which the gaseous silicon source is admitted into the tube, and is further provided with a second end from which the residual gaseous silicon is exhausted, the improvement comprising the steps of: introducing a plurality of wafers into the furnace through the first end;

placing said plurality of wafers into the stream of gaseous silicon such that the broad surface of each of said wafers upon which the polycrystalline material is to deposit is placed perpendicular to the direction of the gas flow;

spacing the wafers a minimum of 30 mils between adjacent surfaces;

heating the wafers to a temperature under 700°C for a time sufficient to grow the desired thickness of polycrystalline silicon material;

establishing a vacuum at the exhaust end of the tube for drawing the gaseous silicon over the wafers;

continuing the flow of the gaseous silicon for a predetermined period and then closing off the flow of said gaseous silicon; and

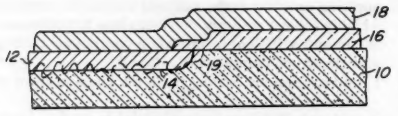
withdrawing said wafers from the furnace by said first end.

3,900,598

OHMIC CONTACTS AND METHOD OF PRODUCING SAME

Edward L. Hall, and Elliott M. Philofsky, both of Phoenix, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 234,252, March 13, 1972, abandoned.
This application July 9, 1973, Ser. No. 377,673
Int. Cl. C23c *1/08*
U.S. Cl. 427—90 5 Claims



1. A method of making an ohmic contact to a semiconductor device comprising the steps of:

forming a protective insulating material pattern on the surface of said device with contact areas of silicon left exposed;

evaporating a layer of contact metal comprising aluminum with a relatively small percentage of at least another metal selected from the group consisting of iron, magnesium, chromium, manganese and cobalt on said pattern and onto said contact area; and

heating said device to form an ohmic contact between said contact metal and said contact areas of silicon;

whereby the nature of the material of the device at said contact areas remains substantially unaffected during the heating forming the ohmic contact and during subsequent heating.

3,900,599

METHOD OF ELECTROLESS PLATING

Nathan Feldstein, Kendall Park, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 2, 1973, Ser. No. 375,380
Int. Cl.[2] C23C *3/00;* B44D *1/02*
U.S. Cl. 427—97 10 Claims

1. In a process of electrolessly depositing a metal on a surface which is catalytic for the deposition of said metal by immersing the surface to be plated in a plating bath, where the bath has sufficient dissolved oxygen therein to cause plating skips, the improvement comprising lowering the dissolved oxygen content substantially prior to starting the plating operation.

9. In a process of electrolessly depositing a metal on a surface which is catalytic for the deposition of said metal, comprising

preparing an electroless plating bath by dissolving a salt of said metal and a reducing agent in water, and

immersing said surface in said plating bath,

the improvement comprising removing at least most of the dissolved oxygen in the water used to prepare said bath prior to adding said salt and said reducing agent.

3,900,600

PARAXYLYLENE-SILANE DIELECTRIC FILMS

Edward C. Spaulding, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 29, 1973, Ser. No. 375,294
Int. Cl. B44d *1/18;* C23c *11/00*
U.S. Cl. 427—99 8 Claims

1. A method for producing dielectric films comprising admixing halogen substituted paraxylylene dimers and silyl amines in a ratio of 1:1 to 5:1 by weight of dimer to amine, heating the admixture to vaporize the admixture and vapor depositing said admixture upon a substrate under reduced pressure.

3,900,601

TREATMENT OF THIN METALLIC FILMS FOR INCREASED DURABILITY

Helmut Franz, Pittsburgh, and David E. Lecocq, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 28, 1973, Ser. No. 401,756
Int. Cl.[2] C03C *17/10*
U.S. Cl. 427—108 11 Claims

1. A method of making a transparent metal coated glass article comprising the steps of

depositing a transparent metallic film of iron, cobalt, nickel, copper, or mixture thereof on a surface of a glass substrate,

heating the metallic film and glass substrate combination to a temperature which is at least 150°C. but below a temperature at which the glass is distorted and maintaining the combination within that temperature range for a time sufficient to substantially reduce the electrical resistance of the metallic film, and thereafter

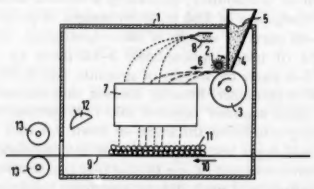
contacting the metallic film with an aqueous solution comprising water and a weak oxidizing agent selected from the group consisting of alkali metal dichromates, ammonium dichromate, alkali metal perborates, ammonium perborate, alkali metal permanganates and ammonium permanganate present as 0.1 to 10 percent by weight of the solution, the solution having a pH of at least about 4.

3,900,602

METHOD AND DEVICE FOR THE MANUFACTURE OF CATALYTIC LAYERS FOR ELECTRODES IN ELECTROCHEMICAL CELLS, PARTICULARLY FUEL CELLS

Werner Rummel, Grossdechsendorf, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Continuation of Ser. No. 142,632, May 12, 1971, abandoned.
This application Aug. 3, 1973, Ser. No. 385,442
Claims priority, application Germany, May 15, 1970, 2023868
Int. Cl. B01k *3/04;* H01n *13/00*
U.S. Cl. 427—115 20 Claims



1. Method for the manufacture of porous catalytic layers for electrodes in electrochemical cells, especially fuel cells, from catalyst powder of different grain sizes which comprises moving a planar substrate generally along a predetermined and

generally straight line path, aerating said catalyst powder of different grain sizes with a gas stream, accelerating and directing a stream of catalyst powder initially in a direction substantially parallel to said straight line path and disposed above said moving substrate, whereby the catalyst powder particles of different size and weight are carried a different distance, and utilizing the effect of gravity to cause said stream of catalyst powder to fall by gravity onto said moving substrate thereby to form a planar layer on the substrate with gradation of the catalyst powder forming the planar layer by grain size and in which the pore structure of said planar layer has pore size changes with smaller pores with the smaller grain particles and with the pore sizes increasing with the larger size particles.

3,900,603

METHOD AND DEVICE FOR PRODUCING A THERMOELECTRIC GENERATOR

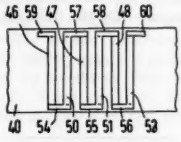
Gerhard Rittmayer, Erlangen; Theodor Renner, Nurnberg-Reichelsdorf; Georg Grubmüller, Nurnberg, and Dieter Falkenberg, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 23, 1971, Ser. No. 201,355

Claims priority, application Germany, Nov. 23, 1970, 2057538

Int. Cl. B44d *1/18*

U.S. Cl. 427—124 **10 Claims**



1. In a method of producing thermocouple elements, especially for low-power thermoelectric generators, having thermocouple element legs of different conductivity types that are located adjacent one another in alternating sequence, with bridges connecting the ends of the legs of different conductivity so that the legs are connected electrically in series and thermally in parallel, on an electrically insulating carrier, wherein the improvement comprises flash vaporizing ZnSb at a temperature of at least 900°C and from the resulting vapor depositing ZnSb as material for the thermocouple element legs upon the carrier, and then tempering the same to change the ZnSb structure from amorphous to crystalline.

3,900,604

METHOD FOR PRODUCING A MAGNETIC RECORDING MATERIAL

Takashi Tanabe, and Tomio Adachi, both of Sagamihara, Japan, assignors to Teijin Ltd., Osaka, Japan

Division of Ser. No. 300,174, Oct. 24, 1972, abandoned. This application Nov. 5, 1973, Ser. No. 412,613

Int. Cl. H01f *10/04*

U.S. Cl. 427—129 **20 Claims**

1. A method for producing a magnetic recording material comprising:

1. preparing an unstretched film of a crystalline polymer selected from the group consisting of aromatic linear polyesters, aromatic linear co-polyesters, polyamides and polypropylene,
2. subjecting the unstretched film to a differential crystallization treatment such that one surface of the film will possess a degree of crystallization which is at least 5% higher than that of the other surface of the film,
3. stretching the treated film from step 2 in at least one direction, and
4. thereafter coating a magnetic layer on said other surface.

11. A method for producing a magnetic recording material which comprises

1. preparing an unstretched film of a crystalline polymer selected from the group consisting of aromatic linear

polyesters, aromatic linear copolyesters, polyamides, and polypropylene,
2. uniaxially, stretching the unstretched film in one direction,
3. subjecting the uniaxially stretched film of step 2 to a differential crystallization treatment such that one surface of said film obtains a degree of crystallization which is at least 5% higher than the degree of crystallization of the other surface of the film,
4. stretching the treated film of step 3 in a direction at right angles to the direction of the uniaxial stretching and,
5. thereafter coating a magnetic layer on said other surface.

3,900,605

METHOD OF FORMING TRAFFIC MARKERS HAVING SHORT TRACK-FREE TIMES

Robert W. Norris, Jr., 1661 Almond Ln. N.W., Salem, Oreg. 97304

Filed Sept. 5, 1973, Ser. No. 394,587

Int. Cl.² G02B *5/128*

U.S. Cl. 427—137 **26 Claims**

1. A method of applying a traffic directing marker to a paved traffic bearing surface which comprises:

a. applying to a traffic bearing surface a wet unset film of a pigmented synthetic organic vehicle resin-containing coating composition which dries inherently track-free within about 6 minutes after application, and
b. applying to the wet coating composition at least a monolayer of light reflecting particulate material, the preponderance of the particles of which being sized so that at least one-half their mass becomes embedded in the coating composition upon application while having a diameter greater than the thickness of the coating film, said particles penetrating substantially the depth of the wet coating composition, said particulate material being applied at such a rate that the individual particles are separated from each other in the coating film by less than their average diameter
c. whereby the applied coating of resin and particles has a track-free time within the order of seconds.

9. A method of applying a traffic directing marker to a paved traffic bearing surface which comprises:

a. applying to a traffic bearing surface a wet unset film of a pigmented synthetic organic vehicle resin-containing coating composition which dries inherently track-free within about six minutes after application, and
b. applying to the wet coating composition at least a monolayer of light reflecting particulate material, the preponderance of the particles of which being sized so that at least one-half their mass becomes embedded in the coating composition upon application while having a diameter greater than the thickness of the coating film,

said light reflecting particulate material having been distributed upon the coating composition before it is dry in an amount at least about *W* weight per unit area *A* where

$$W = \frac{A}{\frac{2.598S^2}{3}XVXG}$$

where

W = weight of light reflecting particulate material
A = unit area of the coating composition
V = volume of the average light reflecting particle
G = specific gravity of the light reflecting particle
S = distance between centers of the light reflecting particle evenly distributed as a monolayer in said coating composition, S being about $2D$ or less, where D is the diameter of the average light reflecting particle,

c. whereby the applied coating of resin and particles has a track-free time measured within the order of seconds.

3,900,606

TEMPORARY SOIL RELEASE RESINS APPLIED TO FABRICS BY SPRAYING

Harry Creston Mandell, Jr., Wayne, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 171,362, Aug. 12, 1971, Pat. No. 3,782,898. This application Oct. 17, 1973, Ser. No. 407,115

Int. Cl. B44d *1/22*

U.S. Cl. 427—155 **4 Claims**

1. The process of treating a textile fabric with an acrylic resin to obtain temporary soil release comprising spraying the fabric with acrylic resin in an aqueous medium containing from about ¼ to about 3 parts of acrylic resin per 5000 parts of water and thereafter drying the fabric to remove water without curing the resin.

3,900,607

POLYLAUROLACTAM POWDERS SUITABLE FOR METAL COATING

Karl-Adolf Muller; Armin Gude, and Gerhard Menzel, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Continuation of Ser. No. 364,430, May 29, 1973, abandoned, which is a continuation of Ser. No. 257,977, May 30, 1972, abandoned, which is a continuation of Ser. No. 695,353, Jan. 3, 1968, abandoned. This application Jan. 14, 1974, Ser. No. 432,873

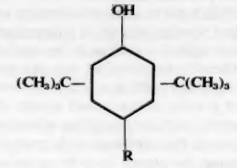
Claims priority, application Germany, Jan. 9, 1967, 41216

Int. Cl. B44d *1/36;* **C08g** *20/10*

U.S. Cl. 427—185 **10 Claims**

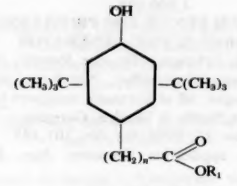
1. In a process of coating a metal substrate with plasticized polylaurolactam powder by the fluidized bed coating process, the improvement comprising employing as said polylaurolactam powder a precipitate recovered from a solution comprising polylaurolactam, a solvent therefor and a plasticizer therefor present in the solution in a concentration of 0.5–3 percent by weight based on the weight of the polylaurolactam,

said solvent being present in sufficient quantities to dissolve said polylaurolactam and said plasticizer, and being a member selected from the group consisting of formic acid, dimethylformamide, 2-ethylhexanol, n-hexanol and cyclohexanone, said plasticizer being at least one member selected from the group consisting of a) a phenol of the formula:



wherein

R is alkyl having from 1 to 18 carbon atoms; b) a hydroxyphenyl carboxylic acid ester of the formula:



wherein

n is O or a positive whole number from 1 to 6 inclusive, and R_1 is alkyl having from 1 to 18 carbon atoms; and c) a phosphorous acid ester selected from the group consisting of a trialkyl ester, triphenylester, tri-(alkylphenyl)-ester, a phenyldialkylester and an alkyl diphenyl ester, each alkyl having from 1 to 18 carbon atoms, inclusive, said precipitate having been dried and provided in the particle size required for the fluidized bed coating process.

3,900,608

PREPARATIONS OF OPTICAL BRIGHTENERS

Hubert Dierkes, Cologne; Karl Schonol, Leverkusen; Joachim Walter, Hitdorf, and Friedhelm Muller, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Oct. 20, 1972, Ser. No. 299,297

Claims priority, application Germany, Oct. 23, 1971, 2152969

Int. Cl. C09k *3/00*

U.S. Cl. 427—158 **3 Claims**

1. A process for whitening of formed fiber materials consisting essentially of treating the formed fibers at temperatures of from 20°–40°C with a whitener liquor which consists essentially of (I) a solution of a dispersion brightener in an organic solvent which is a water immiscible liquid having a boiling point above 150°C and in which the whitener has a minimum solubility at room temperature of 0.3 grams per litre wherein the dispersion brightener is selected from the class consisting of naphthalic acid imides, styryl-triazoles, distyryl derivatives, pyrazoloquinolines, pyrenes, benzoxazoles, pyrazolines, carbostyrils, and coumarines, and wherein the organic solvent is selected from the class consisting of high boiling ethers, phosphoric acid esters, monocarboxylic acid esters, hydroxy carboxylic acid esters, alkanesulfonic acid aryl esters, acetals, epoxidized fatty acids, polymeric esters, alkylbenzenes and dicarboxylic acid esters, in (II) a member selected from the group consisting of aqueous liquors containing an emulsifier for the composition (I) or a water immiscible organic solvent.

3,900,609
METHOD FOR MANUFACTURE OF A REFRACTING, LIGHT PERMEABLE OXIDE LAYER

Baptist Wille, Balzers, Liechtenstein, assignor to Balzers Patent - und Beteiligungs - Aktiengesellschaft, Liechtenstein

Division of Ser. No. 132,041, April 7, 1971, Pat. No. 3,783,010. This application June 4, 1973, Ser. No. 366,482
Claims priority, application Switzerland, Apr. 13, 1970, 005491/70
Int. Cl. C23c *11/00, 13/00*
U.S. Cl. 427—166 7 Claims

1. A method of producing a highly refractive, light permeable optically homogeneous layer on a support, said layer essentially consisting of oxygen, zirconium and tantalum, the ratio of the number of tantalum atoms to zirconium atoms in the layer being in the range of 1 : 1.36 to 1 : 1.7 and the layer being essentially devoid of crystalline zirconium oxide, which comprises heating under vacuum conditions a mixture comprising at least 20 per cent by weight of metallic tantalum and at least 20 per cent by weight of zirconium oxide and in amounts necessary to obtain said ratio thereby to form a vapor, and condensing the vapor on said support.

3,900,610
PROCESS OF MAKING A PRESSURE SENSITIVE ADHESIVE ARTICLE

Lawrence W. McKenna, Jr., Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 9, 1973, Ser. No. 349,168
Int. Cl. C09j *7/04;* C08f *15/40*
U.S. Cl. 427—207 6 Claims

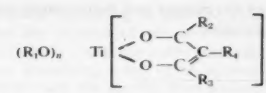
1. A process of manufacture of an article coated with a film of pressure-sensitive resin comprising:

A. preparing an organic solvent solution containing an interpolymer comprising:

1. between 0.5 and 20 weight percent of at least one monomer containing an enolizable keto group selected from the group consisting of N,N-diacetonylacrylamide and N,N-diacetonylmethacrylamide; and
2. at least one monomer selected from the group consisting of esters of acrylic acid and methacrylic acid containing from 6 to 20 carbon atoms;

wherein the interpolymer has a weight average molecular weight in the range of 10,000 to 500,000 and a glass transition temperature in the range of −15° to −75°C.;

B. adding an organic solvent solution of a chelate ester of orthotitanic acid to obtain a solution of the interpolymer containing between 0.01 and 4.0 parts of the chelate ester per 100 parts of interpolymer with a stringiness index of less than 0.3 inches and a viscosity in the range of 25 to 5000 cps. at 20°C., wherein the chelate ester is represented by the formula:



wherein *n* is an integer of 2 or 3, R_1 is a C_2 to C_{10} alkyl, alkenyl, substituted alkyl or substituted alkenyl group, R_2 is a C_1 to C_6 alkyl, alkoxy, alkenyl or alkenoxy group, R_3 is a C_1 to C_6 alkyl or alkenyl group or a C_6 to C_{10} aryl group and R_4 is hydrogen or a C_8 alkyl or alkenyl group, and R_2 and R_3 may be combined as an ethylene or a trimethylene group;

C. coating the article with a film of interpolymer solution on a reverse roll coater or a gravure roll coater; and

D. drying the film of the interpolymer solution.

3,900,611
PARTICULATE MATTER SUPPRESSION USING A SOLUTION OF A SURFACTANT AND A POLYMER

Dennis Thomas Corbett, Chesterfield, and John Wilson, Selston, both of England, assignors to Hemlab AG, Switzerland

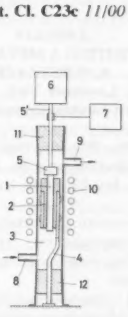
Filed Mar. 9, 1973, Ser. No. 339,795
Int. Cl. B44d *1/02*
U.S. Cl. 427—214 20 Claims

1. A method of preventing the movement of particulate matter which comprises applying to the particulate matter an amount sufficient to consolidate the particulate matter into a compact mass adherent to a selected substrate, of an aqueous solution which is non-irritating to humans, which solution comprises a surfactant selected from the group consisting of an amphoteric surfactant and an amphoteric surfactant in combination with an anionic surfactant, and a homo- or copolymer of an unsubstituted or substituted amide, amine, imine or ethoxy residue having a molecular weight of from about 50,000 to about 30,000,000, in a weight ratio of 10:1 to 70:1 when the surfactant is an amphoteric surfactant and 3:1 to 7:1 when the surfactant is an amphoteric surfactant in combination with an anionic surfactant.

3,900,612
METHOD FOR CHEMICAL VAPOR DEPOSITION OF FITTED SURFACES IN COUPLED ARTICLE

Shigetake Okamoto, Tokyo, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Oct. 11, 1973, Ser. No. 405,536
Claims priority, application Japan, Oct. 11, 1972, 47-101789
Int. Cl. C23c *11/00*
U.S. Cl. 427—232 2 Claims



1. A method for the chemical vapor deposition of fitted surfaces of an article which method comprises, inserting a plunger into a barrel assembly, both plunger and barrel assembly being disposed within a plating chamber, the outer surface of the plunger and the inner surface of the barrel being in fitted relationship to one another, conferring a rotational or vibrational motion upon the plunger or the barrel, supplying vapor of a coating material to the plating chamber, and coat-

ing the fitted surfaces of the plunger and barrel during said rotational or vibrational motion.

3,900,613

PRODUCTION OF SURFACE DIFFUSION ALLOYS

Philippe Marie Galmiche, Clamart, and Andre Hivert, Pontoise, both of France, assignors to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), France

Filed June 25, 1973, Ser. No. 373,097

Claims priority, application France, June 30, 1972, 72.23871

Int. Cl.[2] C23C 9/00, 9/02

U.S. Cl. 427—237 18 Claims

1. In a method of forming a surface diffusion alloy by applying at least one application metal to the inner wall of a hollow metallic part in which a cement comprising a powder of at least one application metal, an inert diluent having a high heat of formation to prevent coalescence or sintering of the particles of the application metal powder during formation of said surface diffusion alloy, and a halogen or halogenated compound for generating vapors of said application metal to the inner wall of the part to be treated, is introduced into the cavity of said hollow part in immediate proximity to said wall, and in which the cement is then heated to generate vapors of the application metal to form a surface diffusion alloy of the application metal and the metallic part at the inner wall of said part; the improvement which comprises:

providing in said cement a surface active agent selected from the group consisting of oleic acid, linoleic acid and ricinoleic acid in an amount sufficient to confer thixotropic properties on the cement such that the cement is temporarily liquefied when subjected to vibration,

subjecting the cement within said cavity, prior to heating the cement, to vibration to temporarily liquefy said cement to facilitate penetration of said cement into remote zones of said cavity to bring said cement into immediate proximity to said wall;

leaving the cement undisturbed within the cavity until it resumes its initial viscosity; and

after heating the cement to form said surface diffusion alloy, removing the cement from within the hollow part.

3,900,614

METHOD OF DEPOSITING A METAL ON A SURFACE OF A SUBSTRATE

David Jacob Lando, Lawrence Twp., Mercer County, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 202,305, Nov. 26, 1971, Pat. No. 3,793,072. This application Aug. 16, 1973, Ser. No. 388,842

Int. Cl. B44d 1/18

U.S. Cl. 427—258 2 Claims

1. A method of depositing a metal pattern on a surface of a substrate, which comprises:

a. coating the surface with a solution comprising an activating metal ion; and

b. impressing said coated surface with a wetting sol, comprising an insoluble hydrous oxide of an element selected from the group consisting of Sn, Pb, Ti, V, Cr, Fe and Bi, said hydrous oxide being capable of reducing said activating metal ion to an activating metal to delineate a pattern corresponding to the desired metallic pattern and deposit said activating metal on said delineated pattern.

2. The method as defined in claim 1 which further comprises treating said activating metal-deposited pattern with an electroless metal plating solution to deposit an electroless metal thereon.

3,900,615

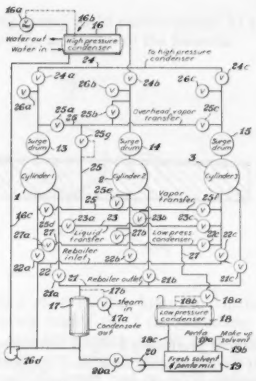
PROCESS FOR TREATING WOOD

James L. Dunn, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 13, 1972, Ser. No. 297,464

Int. Cl. B27k 3/08, 3/40

U.S. Cl. 427—317 5 Claims



1. A process for treating wood which consists essentially of the steps:

a. contacting wood at about 50°C. to about 125°C. with a vaporized chlorinated aliphatic solvent under superatmospheric pressure for a time sufficient to preheat the wood to approximately the temperature of the vaporized solvent,

b. immersing the heated wood in a solution of at least one wood treating agent in said chlorinated solvent at about said temperature and under superatmospheric pressure for about 0.1–10 hours,

c. removing the excess solution from contact with the thereby impregnated wood, and

d. reducing the pressure on the impregnated wood at least to atmospheric pressure, thereby causing vaporization of at least a substantial part of the solvent contained in the wood.

3,900,616

PROCESS FOR COATING A NONPOROUS SUBSTRATE WITH A VINYLIDENE CHLORIDE POLYMER USING A THERMOPLASTIC POLYURETHANE PRECOAT

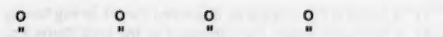
Carl Moore, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 20, 1972, Ser. No. 299,237

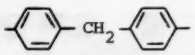
Int. Cl. B44d 1/16

U.S. Cl. 427—385 3 Claims

1. In the process of coating a substantially nonporous substrate having a contact angle to water of from about 50° to 75°C. with a vinylidene chloride polymer latex while using a polyurethane precoat wherein said nonporous substrate is first coated with said polyurethane followed by application of an overcoating of said vinylidene chloride polymer latex and drying of said overcoating, the improvement consisting of utilizing as said precoat the dried residue of a coating consisting essentially of a thermoplastic polyester type polyurethane having the formula



where R is



where R' is

where *n* is an integer of from 1 to 10, and where *x* is an integer of from about 13 to 40, dissolved in an organic solvent therefore.

3,900,617
METHOD OF RENDERING FLEXIBLE SHEET MATERIAL NON-ADHERENT AND ARTICLE PRODUCED THEREBY

Maurice E. Grenoble, Ballston Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Nov. 27, 1973, Ser. No. 419,372
Int. Cl.[2] B44D *1/22, 1/24;* **D21H** *1/38*
U.S. Cl. 427—387 **11 Claims**

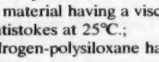
1. A process for rendering flexible sheet material non-adherent to surfaces which normally adhere thereto, which process comprises:

A. treating the sheet material with an aqueous emulsion treating bath containing

i. from 1 to 50% by weight of a vinyl chain-stopped polysiloxane having the formula:

wherein R and R^1 are monovalent hydrocarbon radicals free of unsaturation, with at least 50 mole % of the R^1 groups being methyl and *n* has a value sufficient to provide a fluid material having a viscosity of from 100 to 750,000 centistokes at 25°C.;

ii. an organic hydrogen-polysiloxane having the formula:



wherein R is as defined above, *a* is from 0 to 3, *b* is from 0.005 to 2.0 and the sum of a plus *b* is from about 0.8 to 3, there being at least two silicon-bonded hydrogen atoms per molecule; and

iii. a platinum catalyst effective to cause copolymerization of (i) and (ii), and, thereafter,

B. drying the treated material.

3,900,618
PROCESS FOR REDUCING PILLING TENDENCIES OF ACRYLIC FIBERS AND FIBER PRODUCTS THEREOF

Juichi Sasada, Okayama, Japan, assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 13, 1973, Ser. No. 424,408
Int. Cl. B44d *1/06;* **D06m** *13/26*
U.S. Cl. 427—390 **8 Claims**

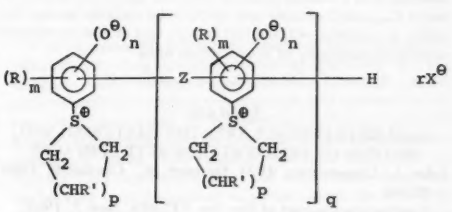
1. A process for reducing the pilling tendencies of acrylic fibers and fiber products thereof which comprises treating an acrylic fiber or product thereof obtained from an acrylonitrile polymer containing at least 80 weight percent acrylonitrile and any balance of one or more ethylenically unsaturated monomers copolymerizable therewith an aqueous solution containing a salt of an alkylsulfate of 8 to 16 carbon atoms, said salt selected from sodium, potassium, and ammonium salts, and sodium carbonate, said treatment being carried out at a temperature in the range of about 50° to 100°C. and so as to deposit from about 0.1 to 2.0 weight percent of said alkylsulfate and from about 0.5 to 3.0 weight percent of sodium carbonate, both percentages based on the dry weight of said fiber or fiber product, and thereafter drying the treated fabric at a temperature in the range of about 60° to 120°C.

3,900,619
INHIBITING THE STAINING OF LATEX PAINTS ON WOOD

Robert H. Lalk; Donald L. Schmidt, and Mary R. Thomas, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 26, 1973, Ser. No. 382,978
Int. Cl. B44d *1/26*
U.S. Cl. 427—408 **13 Claims**

1. The process of inhibiting the staining of latex paint applied to a wood surface containing watersoluble tannin comprising applying to the wood surface, prior to or concurrently with the latex paint, an aqueous solution of a water-soluble cyclic sulfonium compound of the formula



wherein each R independently is Cl, phenyl, phenoxy, lower alkyl or lower alkoxy; each R' independently is H, Cl, Br, OH or lower alkyl; Z is a chemical bond, O, S, alkylene or alkylenedioxy; *m* is 0–2, *n* is 0–1, *p* is 2–3, *q* is 0–5, X is a neutralizing anion and *r* is a number such that the molecule is electrically neutral.

3,900,620
BASIC ALUMINUM SYSTEMS USEFUL AS WOOD-STAIN REDUCING AGENTS

William S. Gilman, South Plainfield; John L. Jones, North Plainfield, and Andrew M. Rubino, New Providence, all of N.J., assignors to Armour Pharmaceuticals Company, Berkeley Heights, N.J.

Filed Sept. 18, 1973, Ser. No. 398,358
Int. Cl. B05d *3/00*
U.S. Cl. 427—408 **17 Claims**

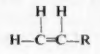
1. A method of preventing staining and discoloration of water-base paint applied to a wood surface due to the leaching of water soluble tannins and natural coloring constituents present in the wood, which method comprises applying to the surface of wood to be painted an aqueous composition comprising a water soluble basic aluminum compound or complex of such compound, said basic aluminum compound or complex being applied in an effective amount to prevent staining of a subsequently applied water-base paint but insufficient to substantially interfere with adhesion between the water-base paint and the treated surface.

3,900,621
IMPREGNATING COMPOSITIONS FOR FIBROUS SHEET MATERIALS

Eduard Muck, Otrokovice; Jaroslav Strachota, Veseli nad Moravou, and Josef Horak, Gottwaldov, all of Czechoslovakia, assignors to Statni vyzkumny ustav kozedelny, Gottwaldov, Czechoslovakia

Division of Ser. No. 177,493, Sept. 2, 1971, Pat. No. 3,852,230. This application Sept. 18, 1974, Ser. No. 507,213
Claims priority, application Czechoslovakia, Oct. 14, 1970, 6906-70
Int. Cl. B44d *1/02*
U.S. Cl. 427—430 **3 Claims**

1. A method of impregnating a mat of fibrous material for imparting pliability and softness to the impregnated fibrous material which comprises immersing such a mat into an impregnating composition comprising an aqueous liquid composition consisting essentially of a mixture of about 100 parts of a polyurethane made from hydroxyl poly (tetramethylene oxide), butanediol 1,4 and diphenylmethane-p,p′-diisocyanate to about 5 to 50 parts of a copolymer having a molecular weight of from about 400 to 3,000 and formed from (a) about 1–20 molar % of an olefinic monomer having 2 to 4 carbon atoms and (b) about 99 to 80 molar % of a second olefinic monomer having the formula:

(I) 

wherein R is a radical selected from the group consisting of linear $C_{4\text{-}20}$ alkyl radicals and carbocyclic radicals having the ability to combine with an alkyl radical, said olefinic monomer consisting essentially of hydrocarbon units.

3,900,622
CONCRETE SURFACE TREATING MATERIAL AND METHOD OF TREATING CONCRETE SURFACES

John A. Caramanian, 1021 Summer St., Cincinnati, Ohio 45204

Continuation-in-part of Ser. No. 837,989, June 3, 1969, abandoned. This application Aug. 28, 1973, Ser. No. 392,246
Int. Cl. C08f *45/42*
U.S. Cl. 427—445 **4 Claims**

1. A composition for treating a concrete surface which consists essentially of approximately 26 parts of an epoxy resin, 6.5 parts of an organic elastomeric polysulfide resin which is compatible with the epoxy resin, 19 parts methyl isobutyl ketone, 19 parts ethylene glycol monoethyl ether acetate, 60 parts ethylene glycol monobutyl ether, and 67 parts diluent, all parts being by weight, the composition having a viscosity of 9 to 25 seconds measured with a Number 4 Ford cup.

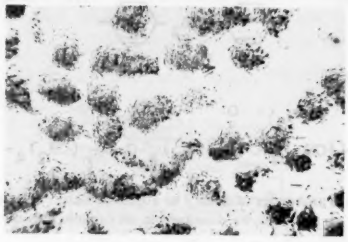
3,900,623
CARPETS AND RUGS

Thomas L. Hatt, Westervoort (Gld.), Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed Oct. 23, 1973, Ser. No. 408,549
Claims priority, application United Kingdom, Oct. 30, 1972, 50017/72
Int. Cl. D03d *27/00;* **D04h** *11/00*
U.S. Cl. 428—92 **12 Claims**

1. A carpet or rug having a cut pile formed by tufts anchored in a backing, each tuft comprising at least two multifilament yarns twisted together to form pile loops, said yarns having been prepared by twisting filaments together, the direction of twist of the yarns to form the pile loops being opposite to the direction of the twist of the filaments, said pile loops being cut whereby said filaments become unwound and entangled only at the tops of the tufts to provide a strong coherent structure.

11. A method for making an improved carpet or rug having tufts of filaments which are entangled at the tops thereof to form a strong coherent structure which comprises twisting filaments at about 50 to about 250 turns per meter to form a yarn, twisting at least two of the resulting yarns together at

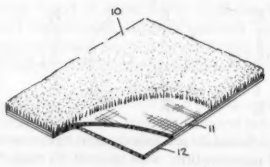


about 50 to about 250 turns per meter in a direction opposite to the twist of the filaments, tufting the resulting twisted yarns into a backing on a tufting machine to form pile loops, cutting the pile loops after tufting whereby the cut filaments unwind and become entangled at the top of the tufts.

3,900,624
STATIC CHARGE RESISTANT SYNTHETIC YARNS

Walter G. Schare, Forge Hollow, Lakeville, Conn. 06039

Continuation-in-part of Ser. No. 187,082, Oct. 6, 1971, Pat. No. 3,778,331. This application July 10, 1973, Ser. No. 377,968The portion of the term of this patent subsequent to Dec. 11, 1990, has been disclaimed.
Int. Cl. A47g *27/02;* **B32b** *15/08, 27/34*
U.S. Cl. 428—97 **6 Claims**



1. A metallized yarn constituted by a flat ribbon formed of nylon film whose faces are rough lusterless surfaces, the faces of said ribbon being coated with an extremely thin layer of a metal selected from the class consisting of tin and aluminum which covers the rough surfaces to create a non-reflective three-dimensional lattice of high electrical conductivity forming an electrically-conductive path to discharge electrostatic charges.

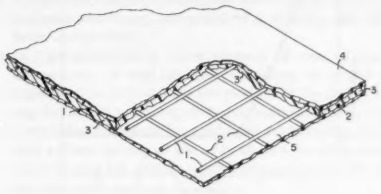
3,900,625
SELF-EXTINGUISHING COMPOSITE LAMINATE

Wei-Gwo Chen, Houston, Tex., assignor to Griffolyn Company, Inc., Houston, Tex.

Filed Mar. 26, 1973, Ser. No. 344,499
Int. Cl. B32b *3/14, 17/04, 27/12*
U.S. Cl. 428—110 **2 Claims**

1. As an article of manufacture, a flexible foldable plastic laminate comprising a grid of non-woven oriented reinforcing fibers selected from the group consisting of polyamides, polyesters, polyolefins, glass, polymers from halogen containing monomers in which the halogen content is at least 10%, polyester fibers containing a fire retardant halogen content and polyimidazoles having a melting point higher than the melting points of the outer films of said laminate, said films consisting of polyolefin films each less than 11 mil thick and each having

incorporated therein as a fire retardant chlorinated paraffin and antimony oxide, the surfaces of said fibers and the inner surfaces of said films being essentially covered, and mutually united, by an organic adhesive having incorporated therein as



a fire retardant a halogenated lower alkyl phosphate and antimony oxide, said fire retardants being present in said films and said adhesive in sufficient quantity that the laminate formed thereof is self-extinguishing.

3,900,626

TANTALUM WIRE REINFORCED SILICON NITRIDE ARTICLES AND METHOD FOR MAKING THE SAME

John J. Brennan, Portland, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Sept. 4, 1973, Ser. No. 394,432

Int. Cl. B32b *5/02*

U.S. Cl. 428—110 **2 Claims**

1. An impact resistant fiber-reinforced composite article suitable for use in a gas turbine engine environment comprising a plurality of continuous tantalum wires preferentially oriented and completely embedded in a hot-pressed, Si_3N_4 matrix which approaches full densification, each of said wires having a layer of tantalum silicide thereon, said tantalum silicide layer being chemically bonded to said wires and said matrix, said composite article exhibiting, as a mode of breakage as a result of Charpy impact tests, either a combination of ductile fiber elongation plus interfacial splitting or ductile fiber fracture.

3,900,627

CONVEYOR BELT

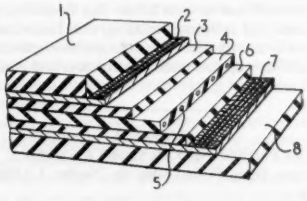
Attilio Angioletti, and Aurelio Brollo, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Dec. 14, 1972, Ser. No. 314,983

Claims priority, application Italy, Dec. 17, 1971, 32524/71; France, Nov. 2, 1972, 72.38752; Netherlands, Oct. 10, 1972, 7213693

Int. Cl. B32b *5/12*

U.S. Cl. 428—114 **6 Claims**



1. A conveyor belt comprising a layer of elastomeric material, at least one layer of coplanar cords embedded in the said elastomeric material and disposed parallel to one another and arranged along the larger dimension of the belt, the diameter of the cords being substantially equal to the thickness of the elastomeric material layer, a layer of fabric disposed on each side of the layer of cords, an elastomeric material disposed between each fabric layer and the adjacent layer of cords and a cover layer of elastomeric material disposed at each face of the conveyor belt, said fabrics having their warp threads arranged along the larger dimension of the conveyor belt and their weft threads arranged transversely to the conveyor belt, said warp threads having an extensibility greater than that of the cord, said weft threads having an extensibility less than that of the warp threads, the ratio of the thickness of the layers of elastomeric material disposed between the fabric and said layer of cords to the diameter of said cords being less than 0.166, and the ratio of the distance between the axes of two cords and the diameter of one cord ranging between 1.5 and 6.

3,900,628

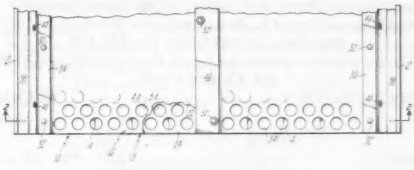
PRETENSIONED SCREEN PANEL

William E. Stewart, Somers, Conn., assignor to Linatex Corporation of America, Stafford Springs, Conn.

Filed June 13, 1973, Ser. No. 369,496

Int. Cl. B07b *1/46;* **B32b** *3/10*

U.S. Cl. 428—134 **8 Claims**



1. A laminated flexible screen panel well suited for use in a vibratory screening operation consisting essentially of a substantially planar laminated sheet structure having an array of screen openings extending therethrough, said laminated structure being comprised of a pretensioned fabric reinforced flexible, nonmetallic backing layer and an abrasion resistant, elastomeric facing layer relatively soft with respect to said backing layer superimposed on and permanently bonded to the backing layer throughout its planar extent, the size of the openings in the backing layer being at least equal to the size of the openings in the facing layer in registry therewith, said elastomeric layer having a substantially planar top wear surface, said backing layer being comprised of a high tensile strength, pretensioned non-extensible material and having sufficient dimensional stability to resist extensive sagging and fluttering across its unsupported transverse extent when subjected to vibratory screening action.

3,900,629

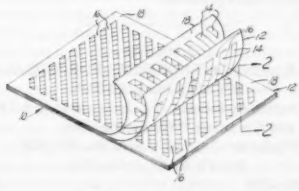
POROUS LAMINATE AND METHOD OF MANUFACTURE

Andrew R. Spencer, Bloomfield Hills, Mich., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Sept. 14, 1973, Ser. No. 397,467

Int. Cl.² B32B *3/26*

U.S. Cl. 428—136 **7 Claims**



1. A porous laminate comprising:

a plurality of lamina having slot patterns formed therein, said lamina stacked in intimate contact with each other

with said slot patterns of adjacent lamina overlapping and extending transversely to each other to provide intersecting slot patterns, said stacked lamina being bonded to each other to form said laminate, whereby said intersecting slot patterns form fluid flow passages through said laminate.

7. A method of manufacturing a porous material comprising:

forming a slot pattern in a plurality of lamina;

stacking said lamina in intimate contact with each other with said slot patterns of adjacent lamina overlapping and extending transversely to each other; and

bonding said lamina to each other to form a porous laminate.

3,900,630

DECORATIVE ARTICLE HAVING INORGANIC COATING FILM HAVING RUGGED PATTERN INCLUDING CRACKS AND PROCESS FOR PRODUCTION THEREOF

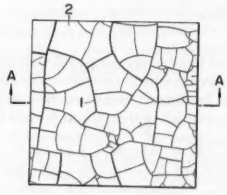
Hiroshi Makishima, Yokohama; Toshio Shinohara, Fujisawa; Yukio Kawahara, Yokohama; Hiroshi Nii, Kamakura; and Setsuo Ebine, Yokohama, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka-shi, Japan

Filed Dec. 28, 1973, Ser. No. 429,175

Claims priority, application Japan, Dec. 29, 1972, 47-3719

Int. Cl. B44d *5/00*

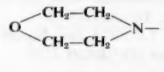
U.S. Cl. 428—155 **11 Claims**



1. A decorative article comprising an inorganic coating film having a rugged pattern including cracks, said inorganic coating film comprising a silicate having the formula

$$M_2OxSiO_2$$

wherein x is a number of from 0.5 to 10 and M is a member selected from the group consisting of (1) alkali metals belonging to Group IA of the Periodic Table, (2) mono-, di-, tri- and tetraamines represented by the formula $R_4—N—$ (R is H, $—CH_2OH$, $—C_2H_4OH$, $—CH_3$, $—C_2H_5$ or the like) and (3) groups represented by the formula $—N{=}C(NH_2)_2$ or



a hardening agent in an amount of 4 to 30% by weight based on the silicate, and a pigment.

3,900,631

FLEXIBLE NONWOVEN SHEETS FOR USE AGAINST SPLASHING LIQUIDS

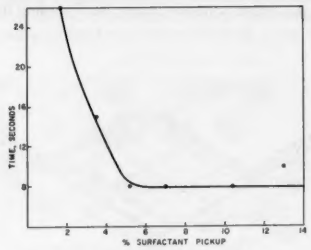
Rudolph Woodell, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 24, 1973, Ser. No. 409,025

Int. Cl. B44d *1/10, 5/00*

U.S. Cl. 428—195 **6 Claims**

1. A flexible nonwoven sheet for use against splashing liquids comprised of film-fibril elements of linear polyolefin, the film-fibril elements on one side of said sheet being fused together to form a continuous surface and having adhered thereto a continuous coating of a hydrophobic polymer effective as a liquid barrier, the other side of the sheet having areas



of unfused film-fibril elements and having a wetting agent adsorbed thereon.

3,900,632

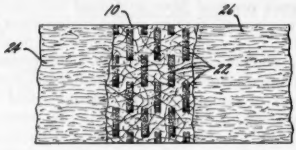
LAMINATE OF TISSUE AND RANDOM LAID CONTINUOUS FILAMENT WEB

James E. Robinson, Crescent Drive, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 15,033, Feb. 27, 1970, abandoned. This application Apr. 3, 1972, Ser. No. 240,754

Int. Cl. B32b *7/14, 7/10, 3/30*

U.S. Cl. 428—196 **11 Claims**



1. A nonwoven fabric-like laminate comprising, in combination,

a. a low basis weight, single ply nonwoven web of substantially continuous and randomly deposited, molecularly oriented filaments of a hydrophobic thermoplastic polymer, said web prepared by continuous polymer extrusion through a spinneret and filament deposition on a supporting surface and having a basis weight of up to about 0.7 oz./yd.^{2} with the filaments thereof having a denier of about 0.5–about 6,

b. a web of cellulose wadding having a basis weight of about 0.3–about 0.7 oz./yd.^{2} disposed in laminar relationship with respect to the single ply web (a), and

c. patterned areas of adhesive disposed between said webs which penetrate into said cellulose wadding web at spaced open areas in a manner so as to provide delamination resistance in combination with fabric-like flexibility, said nonwoven web and cellulose wadding web combining to provide a material with desirable isotropic strength characteristics, fabric-like opaqueness, absorbency, and a natural fabric feel.

3,900,633

PATTERNED TRANSFER SHEET

Jean Gustave Jules Piron, Allee du Ploche, 1-1400 Nivelles, Belgium

Filed Mar. 19, 1973, Ser. No. 342,584

Claims priority, application United Kingdom, Mar. 28, 1972, 14491/72

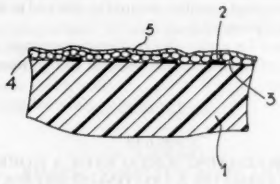
Int. Cl. B41m *3/12, 5/00*

U.S. Cl. 428—204 **11 Claims**

1. A patterned transfer sheet carrying on one surface thereof a plurality of elements or points which together form patterns, any selected portion of one or more of said patterns,

being transferable and adherable to a receptor surface, comprising

1. a light-transmitting temporary support, carrying on its surface,
2. an unplasticized transferable film comprising:
   a. a pigmented layer forming the elements or points of the patterns and being composed of a printing ink with two main components;
   b. a light-transmitting layer formed of one of the main components of said ink and containing dispersed microcapsules covering at least the portion of the pattern carrying surface of said temporary support, said microcapsules containing a solvent for said light-transmitting film with said solvent having at the very most a swelling action on said printing ink and no solubilizing action on the temporary support, and



3. a coating of a pressure-sensitive adhesive covering said light-transmitting layer, the organic components of said pressure-sensitive adhesive being miscible with said light-transmitting layer and soluble in the solvent contained within said microcapsules so that upon transfer, the light-transmitting layer and the pressure-sensitive adhesive interreactable with one another to provide, after transfer to said receptor surfaces, a strong adhesion to said receptor surface, pressure application to the surface of said sheet opposite the surface carrying said transferable film enabling the transfer to a receptor surface in contact with said film the portion of the patterns, composed of one or more of said elements or points, corresponding to the area of applied pressure.

11. A patterned transfer sheet carrying on one surface thereof a plurality of elements or points which together form patterns, said patterns, or any selected portion of one or more of said patterns, being transferable and adherable to a receptor surface, comprising

1. a light-transmitting temporary support, carrying on its surface,
2. an unplasticized transferable film comprising:
   a. a pigmented layer forming the elements or points of the patterns and being composed of a printing ink with two main components;
   b. a light-transmitting layer formed of one of the main components of said ink and containing dispersed microcapsules covering at least the portion of the pattern carrying surface of said temporary support, said microcapsules containing a solvent for said light-transmitting film with said solvent having at the very most a swelling action on said printing ink and no solubilizing action on the temporary support, and
3. a coating of a pressure-sensitive adhesive covering said light-transmitting layer, the organic components of said pressure-sensitive adhesive being miscible with said light-transmitting layer and soluble in the solvent contained within said microcapsules so that upon transfer, the light-transmitting layer and the pressure-sensitive adhesive interreactable with one another to provide, after transfer to said receptor surfaces, a strong adhesion to said receptor surface, pressure application to the surface of said sheet opposite the surface carrying said transferable film enabling the transfer to a receptor surface in contact with said film the portion of the patterns, composed of one or more of said elements or points, corresponding to the area of applied pressure, said temporary support being parchment paper coated with silicone, said ink comprising 10 parts by weight of pigments, 60 parts by weight of ethylhydroxyethylcellulose, 30 parts by weight of nitrocellulose 1/2 seconds, said light-transmitting film comprising 100 parts by weight of ethylhydroxyethylcellulose, 100 parts by weight of microcapsules having a diameter less than 60 microns, said layer of pressure-sensitive adhesive having a thickness of at most 25% of that of said light-transmitting film without taking into account the size of the microcapsules contained in said light-transmitting film, the pressure-sensitive adhesive comprising 10 parts by weight of polyisobutylene having a number average molecular weight of 300,000, 20 parts by weight of polyisobutylene havin a number average molecular weight of 8000, 10 parts by weight of polyisobutylene having a number average molecular weight of 820, 13 parts by weight of methylcyclohexane resin and 10 parts by weight of primary particles of silica having a diameter less than 50 millimicrons.

3,900,634

GLAZING PANEL WITH CONDUCTIVE STRIPS

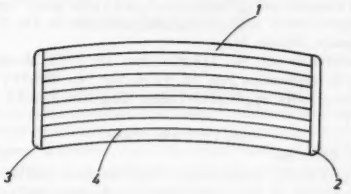
Emile Plumat, Gilly, and Pierre Demoulin, Fleurus, both of Belgium, assignors to Glaverbel-Mecaniver S.A., Watermael-Boitsfort, Belgium

Filed July 12, 1973, Ser. No. 378,402

Claims priority, application Luxemburg, July 21, 1972, 65769

Int. Cl. C23c *17/00;* **H05b** *3/12*

U.S. Cl. 428—208 **10 Claims**



1. In a method of manufacturing an electrically heatable transparent glazing panel by providing a transparent glass substrate with at least one electrically conductive coating strip in which heat can be generated by the Joule effect, the improvement comprising: applying onto said substrate, to form at least one such strip, a coating composition composed of a suspension or paste incorporating electrically conductive metal particles substantially all of which are below 5 microns in size, intermixed with glass particles, the glass particles being composed of intermixed particles of lead borosilicate glasses of different softening points, at least the lower one of which softening points is lower than that of the glass composing said substrate, and substantially all of which glass particles are below 5 microns in size; and subsequently firing such applied composition to cause at least that one of such glasses which has such lower softening point to serve as a binder for the metal particles; and wherein the metal particles are present in the composition in sufficient proportion in relation to the glass particles to render the coating strip electrically conductive.

6. In a transparent glazing panel composed of a glass substrate carrying at least one attached electrically conductive coating strip in which heat can be generated by the Joule effect, the improvement wherein said strip comprises electrically conductive metal particles together with intermixed lead borosilicate glasses of at least two different softening points, at least the lower softening point glass serving as a binder for said metal particles, substantially all of the metal particles are below 5 microns in size and at least the higher softening point

glass is present in the form of particles substantially all of which are below 5 microns in size.

3,900,635

MULTILAYER SHRINKABLE FILM FOR POULTRY BAGS

James O. Funderburk, Jr., Bolingbrook, and Stephen J. Vicik, Darien, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 22, 1972, Ser. No. 227,789
Int. Cl. B32b *27/08*
U.S. Cl. 428—213 14 Claims

1. A multilayer heat-shrinkable film having a shrinkage of at least 25 percent in the transverse direction at a temperature of from about 90° to about 95°C., and being suitable for use in fabricating bags for frozen poultry, said film consisting essentially of:

a. a biaxially oriented first layer comprising a first ethylene polymer selected from the group consisting of ethylene homopolymer having a density not greater than about 0.93, and ethylene copolymer, said first ethylene polymer having a melt index of less than about 2.3; and

b. a biaxially oriented second layer comprising a blend of an ionomer and a second ethylene polymer, said second ethylene polymer being selected from the group consisting of ethylene homopolymer having a density not greater than about 0.93, and ethylene copolymer; wherein each layer constitutes from about 20 percent to about 80 percent of the total thickness of said film.

3,900,636

METHOD OF TREATING CUTTING EDGES

Francis Russell Curry, Maidenhead, and Colin John Clipstone, Spencers Wood, both of England, assignors to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 218,824, Jan. 18, 1972, abandoned. This application July 18, 1974, Ser. No. 489,751
Claims priority, application United Kingdom, Jan. 21, 1971, 2847/71
Int. Cl. C23c *17/00*
U.S. Cl. 427—38 7 Claims

1. A process for improving a coated or uncoated steel cutting edge, said process comprising implanting ions selected from the group consisting of metals, reactive non-metals and inert gases into said cutting edge, said ions being propelled at said cutting edge in the form of an ion beam at energies of between about 10 to 400 KeV until a dose of between about 1×10^{14} ions/cm^2 to 6×10^{17} ions/cm has been implanted.

3,900,637

COLLAPSABLE CHRISTMAS TREE APPARATUS

Charles F. Byrd, 1129 New Hampshire Ave., Washington, D.C. 20037, and William Dailey, 36842 Weber, Sterling Heights, Mich. 48077

Filed Nov. 6, 1974, Ser. No. 521,313
Int. Cl. A47g *33/06*
U.S. Cl. 428—9 10 Claims

1. A collapsable artificial tree apparatus comprising:

a plurality of rotatable tree limbs, each having a free end, an intermediate pivoting section and a base end;

an inner means adapted to make contact with the base of said rotatable limbs;

an outer means which runs substantially parallel to said inner means and which serves as a fulcrum to support the pivoting section of said rotatable tree limbs; and

a lever means for causing said inner means to move in a direction parallel to said outer means, said lever means being adapted to contact both said inner means and said outer means during said movement,

wherein the movement of said lever means in a first direction causes said rotatable tree limbs to rotate toward a folded position and movement of said lever means in an opposite second direction causes said limbs to rotate toward an open position.

3,900,638

INFLATABLE CHRISTMAS TREE ORNAMENT

Salvatore J. Du Bato, 416 Puamamane, Honolulu, Hawaii 96821

Filed May 31, 1974, Ser. No. 474,988
Int. Cl. A47g *33/08*
U.S. Cl. 428—11 3 Claims

1. A Christmas tree ornament comprising:

a suitably shaped and decorated inflatable hollow body having an orifice;

a vertical hollow sleeve open at both ends, one end of the sleeve being secured to the orifice, the sleeve extending out of the body;

a flexible elongated member secured at one end to the other end of the sleeve; and

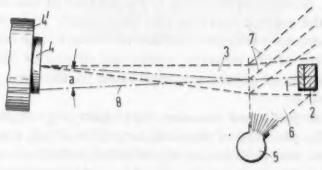
a plug adapted for removable sealing engagement with the other end of the sleeve and secured to the other end of the member.

3,900,639

METHOD FOR COATING SURFACES OF A WORKPIECE BY SPRAYING ON A COATING SUBSTANCE

Richard Lauterbach, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 29, 1973, Ser. No. 410,891
Claims priority, application Germany, Nov. 7, 1972, 2254491
Int. Cl. B05b *7/16, 7/20*
U.S. Cl. 427—34 2 Claims



1. A method of applying a homogeneous coating of material on a surface of a workpiece comprising creating a jet of heated particles of material, directing the jet of particles along a path at the surface to be coated, removing decomposition products from the jet of particles prior to contacting the surface of the workpiece by directing a flow of gas transversely to the path of the jet to deflect the decomposition products from the path of the jet of particles prior to the particles of the jet striking the surface of the workpiece, and collecting the decomposition products deflected from the path of the jet of particles.

3,900,640

HOLLOW, MULTI-LAYERED, CROSS-LINKED PLASTIC STRUCTURES AND PROCESS FOR PRODUCING SAME

Camillo M. Vecchiotti, Ridgewood, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Oct. 29, 1973, Ser. No. 410,815
Int. Cl.[2] B65D *85/84, 11/20;* B32B *27/36, 27/32*
U.S. Cl. 428—36 5 Claims

1. A laminate comprising a first layer of a thermoplastic polyester and a second layer of a cross-linkable polyethylene, the melting point of the polyethylene being lower than the melting point of the polyester, said layers being directly cross-linked at their interface.

3,900,641
METHOD OF FORMING DECORATOR PANELS

Gerald A. Woodman, Bel Air; Joseph Uscher, Studio City, and Henry C. Jacoby, North Hollywood, all of Calif., assignors to Lancaster Products Company, Redondo Beach, Calif.

Continuation of Ser. No. 219,895, Jan. 21, 1972, abandoned. This application Mar. 15, 1974, Ser. No. 451,579
Int. Cl.[2] B41M 1/12, 1/30
U.S. Cl. 428—38 13 Claims

1. A simulated stained glass made by creating a raised boundary grid pattern around colored panels located on a sheet of clear plastic, employing the method comprising the steps of:

a. placing a coarse silk screen, approximating the mesh size used to strain and clean batches of paint, over the plastic sheet;

b. placing a mask including the desired grid pattern over the screen;

c. applying a thick viscous opaque paint to the plastic sheet through the masked screen;

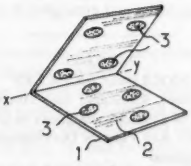
d. removing the screen and mask from the surface of the plastic sheet; and

e. drying the viscous opaque paint.

3,900,642
BINDING STRIP FOR BOOK LEAVES

Marcel Michel, 13 Rue du Fort, Noisy Le Roi, France

Filed Dec. 11, 1972, Ser. No. 314,242
Claims priority, application France, Dec. 17, 1971, 71.45465
Int. Cl. B32b 3/04; C09j 7/02
U.S. Cl. 428—40 3 Claims



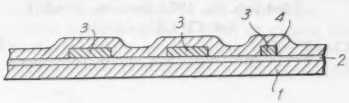
1. An adhesive binding strip comprising a flexible outer sheet having a medial transverse fold, a coating of pressure-sensitive adhesive extending substantially completely over the inner surface of said outer sheet, an inner sheet secured to said outer sheet by said pressure-sensitive adhesive and having openings therethrough which expose areas of said pressure-sensitive adhesive which are distributed to either side of said fold for contact with leaves to be bound, said areas of pressure-sensitive adhesive to one side of said fold being entirely out of registry with said areas of pressure-sensitive adhesive to the other side of said fold when the strip is folded together, and a coating of anti-adhesive material over substantially the entire inner surface of said inner sheet.

3,900,643
DECALCOMANIA WITH REMOVABLE LACQUER COATING

Karl-Heinz Kluge, Mainz, and Alfred Eppich, Zirndorf, both of Germany, assignors to F. Xavier Leipold, Zirndorf, Germany

Filed Dec. 20, 1972, Ser. No. 317,036
Int. Cl.[2] B44F 1/00
U.S. Cl. 428—40 6 Claims

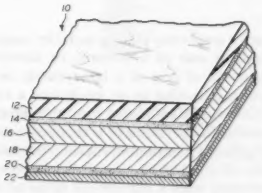
1. A decalcomania suitable for the decoration or labelling of articles, comprising a carrier, an adhesive layer on one face of said carrier, an inscription of a pigment-containing insoluble resin on said adhesive, and a lacquer mask over said inscription, said carrier being so bonded to said adhesive layer as to be readily removable from same immediately prior to application of said inscription to an article, and said lacquer mask being readily removable from said inscription subsequent to application of same to said article by reason of the fact that said insoluble resin of said inscription is unattacked by the solvent from which said lacquer is applied.



3,900,644
HEAT RESISTANT LAMINATE

Martin M. Sackoff, and Gregory F. Pulaski, both of Glen Falls, N.Y., assignors to United Merchants and Manufacturers, Inc., New York, N.Y.

Filed Mar. 20, 1973, Ser. No. 343,159
Int. Cl. B32b , 15/08
U.S. Cl. 428—40 8 Claims

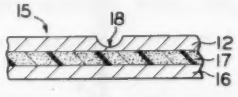


1. A flexible heat resistant laminate comprising a series of layers bonded together, said layers consisting essentially of a top layer of a transparent polyester film having a high softening point, a second layer of a hard surfaced, flexible nonwoven, fibrous strengthening and indentation resistant material, a third layer of a flexible metal foil heat sink, a fourth layer of a pressure-sensitive adhesive, and a bottom layer of a release sheet.

3,900,645
SCORED ADHESIVE LAMINATE

Burton D. Morgan, Hudson, Ohio, assignor to Morgan Adhesives Company, Stow, Ohio

Division of Ser. No. 689,435, Dec. 11, 1967, Pat. No. 3,570,337. This application Oct. 7, 1970, Ser. No. 78,887
Int. Cl. B32b 3/00
U.S. Cl. 428—41 4 Claims



1. A flexible laminate for use as a label, decal or the like, comprising

a face sheet,

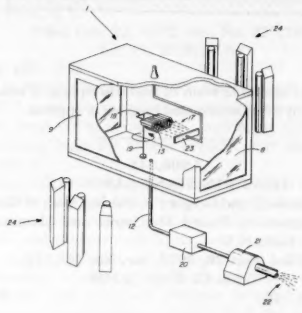
a layer of pressure sensitive adhesive secured to the back surface of said face sheet, and

a fiber paper backing layer removably secured to said adhesive layer and having a reduced thickness potential tear line formed in such material, the fibers of the paper backing layer being appreciably compacted at the potential tear line, the paper having a release coating on its inner surface which engages the adhesive layer.

3,900,646
METHOD OF PLATING METAL UNIFORMLY ON AND THROUGHOUT POROUS STRUCTURES

Robert A. Clyde, 165 Burlington Ave., Rochester, N.Y. 14619

Filed Feb. 21, 1973, Ser. No. 334,261
Int. Cl. C23c *11/02*
U.S. Cl. 427—55 8 Claims

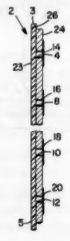


1. A process for uniformly plating metal by vapor deposition on and throughout one of a ceramic or alumina substrate having the structure of one of a honeycomb or sponge, the process comprising heating in an enclosure a rotatably suspended substrate by radiant means until the substrate reaches the decomposition temperature of a thermally decomposable metal bearing gaseous compound, rotating the substrate, passing a thermally decomposable metal bearing compound into the enclosure along with a carrier gas so as to have the gas come into intimate contact with the substrate while continuously rotating the substrate at a rate of at least about two rpm and continuously activating and deactivating the radiant means so as to maintain the temperature of the workpiece at about the decomposition temperature of the metal bearing gas, whereby the metal is uniformly plated on and throughout the substrate.

3,900,647
MESSAGE TAPE FOR INSTRUMENT DISPLAY SYSTEMS

Vincent Scardilli, West Orange, and Arthur Sessman, Jersey City, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Filed Dec. 1, 1971, Ser. No. 203,621
Int. Cl. B32b *3/10*
U.S. Cl. 428—67 3 Claims

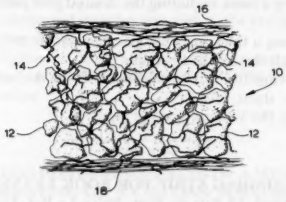


1. A message tape for instrument display systems, formed in a closed loop configuration, comprising:
a clear plastic backing lamination;
a metallic lamination over the backing lamination and having a plurality of messages cut therethrough to the backing lamination;
a plurality of color coding dyes overlaying the metallic lamination and each of said dyes selectively extending through a cut message;
a clear plastic lamination covering the metallic lamination and having an adhesive surface for adhering to the metallic lamination; and
the backing lamination retaining the color coding dyes.

3,900,648
SPACE FILLING MATERIAL AND METHOD

Imre Jack Smith, 283 Hillhurst Blvd., Toronto, Ontario, Canada

Filed Mar. 18, 1974, Ser. No. 452,395
Int. Cl. B32b *3/20, 5/16*
U.S. Cl. 428—71 13 Claims

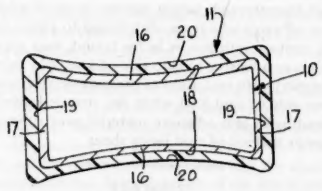


1. A light-weight, space filling material for use as upholstery padding, packing material, thermal insulation, cushion filling, and the like and comprising:
a mass of non-woven crimped synthetic filaments, and,
random shaped cellular foam particles interspersed in said mass and engaged by and entangled in said filaments.

3,900,649
MOULDED ARTICLES

Frederick Leslie Hart, Cressage, and Herbert John Sharp, Greenford, both of England, assignors to GKN Sankey Limited, Stafford and Aro Plastics Development Limited, London, both of, England

Continuation-in-part of Ser. No. 189,937, Oct. 18, 1971, abandoned. This application Jan. 25, 1974, Ser. No. 436,647
Claims priority, application United Kingdom, Oct. 19, 1975, 49523/70
Int. Cl. B32b *7/04*
U.S. Cl. 428—76 4 Claims



1. A composite article comprising a rigid, metal reinforcing core completely embedded in a covering layer of plastics material so that the external surface of the core and the internal surface of the covering layer of plastics material are free to move relative to one another and are not bonded together, the plastics material having a coefficient of thermal expansion over a predetermined temperature range greater than the co-efficient of thermal expansion of the metal of the core, the external surface of the core presenting to the internal surface of the covering of plastics material a first, smoothly-curved concave surface part which, at a first temperature at the upper end of said range, is engaged by a portion of the covering layer which has a second, concave, smoothly-curved, external surface, the first and second surfaces being aligned, the curvatu-

rue of said first surface and the thickness of said portion of the covering layer being such that at a second temperature at the lower end of said range said portion of the covering layer has lifted away from said first surface thus reducing the tensile stresses which occur in said portion of the covering layer due to differential contraction of the plastics material and the metal of the core as the temperature of the article is reduced from the upper end of said temperature range to the lower end of said range as compared with the tension stresses which would occur in said portion of the plastics material if it were unable to lift off said first concave surface.

3,900,650

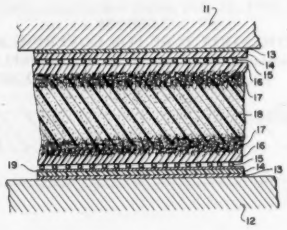
FIBRILLAR LOCKING SYSTEM

James W. Sedore, 11 Jason St., Pittsfield, Mass. 01201

Filed Feb. 8, 1973, Ser. No. 330,544

Int. Cl. B32b *5/18, 27/40;* **B29d** *27/00*

U.S. Cl. 428—86 **10 Claims**



1. A laminated sandwich panel comprising:
a first outer laminate resin layer;
a first inner layer bonded at an outer surface thereof to said outer laminate resin layer, said first inner layer comprising a mixture of resin and a sufficient quantity of chopped fibers per unit area of said first inner layer to form a fibrillar surface of a multiplicity of said fibers extending from the inner surface of said first inner layer; and
a layer of foamed synthetic resin bonded on one surface to said first inner layer with said extending fibers of said first inner layer interlocking with said layer of foamed synthetic resin.

3,900,651

HEAVY DUTY SANDWICH ELEMENT

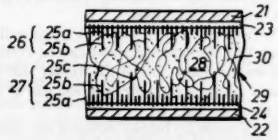
Peter Hoppe, Troisdorf; Gustav Drouven, Bensberg; Martin Wandel, Dormagen; Ernst Gutschik, Dormagen, and Dieter Brokmeier, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 31, 1973, Ser. No. 411,521

Claims priority, application Germany, Nov. 11, 1972, 2255454

Int. Cl. B32b *3/14, 3/26*

U.S. Cl. 428—86 **8 Claims**



1. In a heavy duty sandwich element having:
a. a surface layer
b. a layer of adhesive applied to the surface layer and having flock fibers embedded therein, and
c. a foam core adjacent the layer of adhesive and into which the flock fibers extend, said foam core forming a marginal zone with the layer of adhesive and flock fibers,
the improvement comprising flock fibers of varying lengths whereby the density of the marginal zone of the foam core decreases approximately continuously to the interior of the core.

3,900,652

MALE PIECE OF THE VELVET TYPE FASTENER

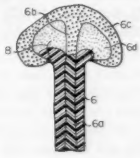
Tohru Uraya, Kobe, and Eichi Kudo, Osaka, both of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed May 22, 1973, Ser. No. 362,802

Claims priority, application Japan, May 29, 1972, 47-65501

Int. Cl. B29d *21/00*

U.S. Cl. 428—92 **2 Claims**



1. In a male piece of a velvet type fastener provided with a plurality of male elements projected upright from a base fabric, an improvement comprising, each male element made of a synthetic monofilament yarn composed of a core portion extended along an axis thereof and a sheath portion encircling said core portion, said core portion composed of a first polyamide polymer of a lower melting point while said sheath portion is composed of a second polyamide polymer of higher melting point in comparison with said first nylon polyamide resin, said male element being composed of a stem and a laterally expanded cap formed at a top end portion of said stem, said cap being composed of a core and an outer layer formed with said first polyamide polymer and an intermediate portion being formed with said second polyamide polymer, the temperature difference between said melting points of said first and second polyamide polymers being between 40° and 60°C.

3,900,653

COMPOSITE POLYESTER FILMS AND PROCESS FOR PRODUCING THE SAME

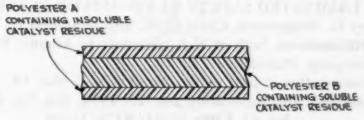
Robert Riboulet, Crepieux, and Eugene Charvet, Saint-Maurice de Beymost, both of France, assignors to La Cellophane, Paris, France

Filed Feb. 13, 1973, Ser. No. 332,183

Claims priority, application France, Feb. 16, 1972, 72.05115

Int. Cl. B32b *33/00, 27/18, 27/36*

U.S. Cl. 428—212 **9 Claims**



1. A composite monoaxially or biaxially oriented polyester laminate consisting essentially of (A) at least one polyester film layer formed from the polycondensation of a dicarboxylic acid and a glycol having from 2 to 6 carbon atoms in the presence of an ester interchange and polycondensation catalyst system, the residue of which is at least substantially insolu-

ble in the polyester melt, and (B) at least one polyester film layer formed by the polycondensation of a dicarboxylic acid and a glycol having from 2 to 6 carbon atoms in the presence of an ester interchange and polycondensation catalyst system, the residue of which is at least substantially soluble in the polyester melt wherein said layer (A) containing the insoluble catalyst residue comprises from 5 to 25% by weight of the composite polyester laminate and wherein said layer (B) containing the soluble catalyst comprises from 95 to 75% by weight of the composite polyester laminate.

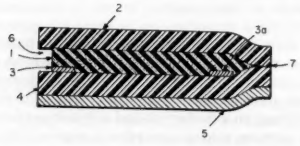
3,900,654
COMPOSITE POLYMERIC ELECTRIC HEATING ELEMENT

Henry Joseph Stinger, Devon, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 162,870, July 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 60,551, Aug. 3, 1970, abandoned. This application Dec. 11, 1972, Ser. No. 314,021

Int. Cl. H05b *3/36;* **B32b** *27/36, 15/08*

U.S. Cl. 428—214 **13 Claims**



1. A laminated structure useful as an electric heating element which comprises

1. a layer of electrically conductive elastomeric material containing electrically conductive carbon black dispersed in a fluorocarbon elastomer, said layer having a specific resistivity of about 0.1–4 ohm centimeters,

said fluorocarbon elastomer being an elastomeric copolymer of vinylidene fluoride and at least one other fluorine-containing monomer,

the conductive carbon black content of said layer being about 10–100 parts per 100 parts by weight of said elastomer,

2. a film of electrically insulating polymeric material in superposed adherent relation with layer (1), and

3. a conductor means in attached contact with layer (1) for electrically connecting the structure to an electric power supply.

3,900,655
LAMINATED SAFETY GLASS AND/OR PLASTIC

Larry G. Wolgemuth, Cherry Hill, and Benjamin C. Wilbur, Williamstown, both of N.J., assignors to Atlantic Richfield Company, Philadelphia, Pa.

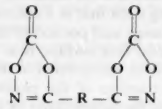
Continuation-in-part of Ser. No. 359,822, May 14, 1973, abandoned. This application Jan. 25, 1974, Ser. No. 436,429

Int. Cl. C08g *22/04;* **B32b** *27/40*

U.S. Cl. 428—214 **22 Claims**

1. A laminated safety glass article comprising an interlayer of a preformed polyurethane elastomer sandwiched between a layer of glass and a second layer selected from the group consisting of glass and rigid transparent plastic wherein said polyurethane is the reaction product of

a. a cyclic nitrile carbonate compound having the formula



wherein R is a divalent hydrocarbon radical having about 1 to 50 carbon atoms, and

b. at least one hydroxyl-containing compound selected from the group consisting of (1) a high molecular weight glycol having a number average molecular weight of from about 550 to about 4,000, and (2) a low molecular weight diol having primary or secondary aliphatic hydroxyl groups and a molecular weight less than about 250, said laminated article being the product of heating and pressing an assembly wherein said preformed elastomer sheet is in interposed relation with said layers.

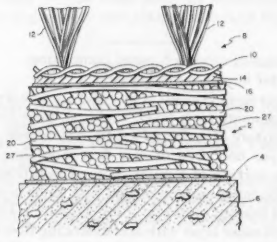
3,900,656
SYNTHETIC STRUCTURE FOR COVERING A SURFACE

John C. Schmidt, 231 Chestnut St., Haddonfield, N.J. 08033

Filed June 21, 1973, Ser. No. 372,207

Int. Cl. B32b *5/18*

U.S. Cl. 428—215 **10 Claims**



1. In a recreational surface covering a subsurface, including a top wear surface layer selected for a recreational activity, at least one underlayment layer between the top surface and the subsurface comprising,

an integral layer containing substantially uniform adhering strands,

each strand being a closed cell gas inflated organic polymeric material having polyhedral-shaped cells defined by film-like cell walls about 2 microns thick, substantially impervious to the gas contained therein,

each strand being about 50 mils in diameter and about 3 inches long,

the strands being oriented substantially parallel to the plane of the layer in crossing directions,

said strands being bound in a resilient open celled binder material such that the underlayment can be compressed to expell air from the open cells of the binder and yet retains the pneumatic resilience of the trapped gas in the closed cells in the strands, and

means providing a moisture barrier between the underlayment and the environment around the surface,

the thickness of the underlayment layers being at least about 0.5 inches, said thickness being selected to provide in combination with other layers a recreational surface suitable for selected recreational activity.

3,900,657

HEAT RESISTANT MATERIAL

Ryozo Nakayama, and Sigeru Itakura, both of Yokohama, Japan, assignors to Tokai Metals Co., Ltd., Japan

Filed May 5, 1972, Ser. No. 250,690
Claims priority, application Japan, May 17, 1971, 46-32374
Int. Cl. B05c 9/04
U.S. Cl. 428—216 5 Claims

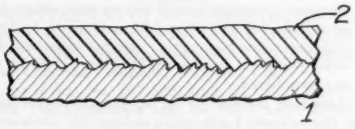
1. A heat resistant material, which consists of an aluminum or aluminum alloy foil of a thickness to 0.02mm having finely powdered aluminum adherently bound to both side surfaces thereof to a thickness of no more than 2 microns.

3,900,658

POLYFLUOROCARBON ARTICLE AND METHOD FOR MAKING THE SAME

Tuneo Fujii, Suita, and Yukiharu Nakamura, Ibaraki, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 117,021, Feb. 19, 1971, abandoned.
This application July 12, 1973, Ser. No. 378,500
Claims priority, application Japan, Feb. 21, 1970, 45-15121
Int. Cl. B32b 31/24, 27/06
U.S. Cl. 428—220 3 Claims



1. A sintered polyfluorocarbon film or sheet having a chemically metallizing layer on one side in order to improve the adhesiveness of said film or sheet

wherein said polyfluorocarbon is selected from the group consisting of polytetrafluoroethylene and a copolymer of tetrafluoroethylene and hexafluoropropylene and

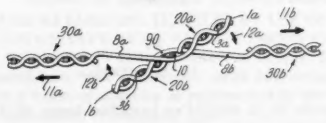
said chemically metallizing layer comprising a water-insoluble crystalline metal salt or oxide of a metal selected from the group consisting of iron, copper, zinc, manganese, chromium, sodium, potassium, and aluminum, wherein said film or sheet consists essentially of said polyfluorocarbon and said chemically metallizing layer.

3,900,659

WOVEN CLOTH SEAM

Donald George MacBean, Pierrefonds, Canada, assignor to JWI Ltd., Montreal, Canada

Filed Sept. 18, 1973, Ser. No. 398,444
Claims priority, application United Kingdom, Sept. 23, 1972, 44124/72
Int. Cl.² B32B 7/08; D21F 1/12
U.S. Cl. 428—223 17 Claims



1. A seam for joining together two ends of a woven cloth having a length and a width;

said cloth comprising;

a plurality of warp strands extending in the lengthwise direction of said cloth and disposed in side-by-side relationship along the width of said cloth;

a first area of warp adjacent one end of said cloth and formed by said warp strands with interwoven weft strands;

a second area of warp adjacent the other end of the cloth and formed by said warp strands with interwoven weft strands;

a third area of warp interposed between said first and second areas and formed by said warp strands with interwoven weft strands;

said third area having a first end adjacent said first area and a second end adjacent said second area;

a selected first set of warp strands of said first area being joined with corresponding warp strands of said third area by a first weftless continuation of said warp strands;

a selected second set of warp strands of said second area being joined with corresponding warp strands of said third area by a second weftless continuation of said warp strands;

each of said warp strands in said first and second weftless continuations of said warp strands comprising a crimp;

some of said crimps extending in an upward direction relative to said cloth, and others of said crimps extending in a downward direction relative to said cloth;

said seam comprising;

an intermesh of said crimps in said first and said second weftless continuations;

said crimps being adjacent one another along the width of said cloth when said warp strands of said first weftless continuation of said warp strands and said second weftless continuation of said warp strands are intermeshed;

whereby the crimps cooperate to form a cylindrical-like opening along the width of the cloth;

and coupling means being inserted in said cylindrical-like opening to thereby fasten one end of said cloth to the other end thereof;

characterized in that said first area of warp lies on said second weftless continuation between said coupling means and the second end of the third area on one side of the intermesh, and in that said second area of warp lies on said first weftless continuation between said coupling means and the first end of said third area on the other side of the intermesh.

3,900,660

MANUFACTURE OF SILICON METAL FROM A MIXTURE OF CHLOROSILANES

Howard B. Bradley, St. Mary's, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 282,108, Aug. 21, 1972, abandoned, which is a continuation of Ser. No. 81,835, Oct. 19, 1970, abandoned. This application Jan. 11, 1974, Ser. No. 432,438
Int. Cl. C23c 11/06
U.S. Cl. 427—248 1 Claim

1. The process for making polycrystalline silicon metal of semiconductor quality which comprises providing a gaseous chlorosilane mixture of dichlorosilane and trichlorosilane in combination with hydrogen gas in a reactor containing a hot deposition surface at a temperature of about 850°C. to about 1,300°C., causing decomposition of dichlorosilane and tri-

chlorosilane in said reactor and depositing such as polycrystalline metal on said hot deposition surface, and the amount of dichlorsilane in said mixture comprises from about 5 mole percent to about 70 mole percent thereof and the chlorosilane mixture comprises 5 percent to 30 percent of the moles of the combination of said mixture and hydrogen provided in said reactor.

3,900,661

GLASS FIBER REINFORCED ELASTOMERS

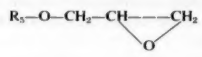
Frank Paul McCombs, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 27, 1973, Ser. No. 354,980
Int. Cl. C07f *7/18;* **C07d** *1/00;* **B32b** *17/04*
U.S. Cl. 428—250 **18 Claims**

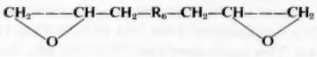
1. Glass fibers having a coating thereon, said coating comprising (A) a blend of resorcinol-aldehyde resin and an elastomer and (B) from 0.1 to 25 percent by weight of a combination of organo silicon compounds comprising 1 to 35% of (1) an amino-substituted organo silane or its hydrolysis products and 99 to 65% of (2) an organo silicon compound containing at least one beta-haloalkoxy group in the form of a reaction product of (a) a halosilane

$$(R_3)_e SiX_{(4-e)}$$

wherein R_3 is an organic group, X is halogen and e is 0 or an integer from 1 to 2, (b) an alkylene oxide containing 2 to 6 carbon atoms aand (c) an epoxide selected from the group consisting of a monoepoxide of the formula



wherein R_5 is a functional organic group selected from the group consisting of aryl, alkyl and substituted alkyl, alkenyl and acryl group and a methacryl group; a diepoxide of the formula



wherein R_6 is a divalent organic group selected from the group consisting of oxyalkyleneoxy, oxyalkyleneoxyalkyleneoxy and a divalent aromatic group; and a cycloalkane diepoxide, with the reaction product containing 1 to 3 epoxide equivalents of (b) and 0.5 to 3.0 epoxide equivalents of (c) per mole of halosilane.

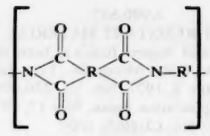
3,900,662

BONDABLE ADHESIVE COATED POLYIMIDE FILM AND LAMINATES

Edward L. Yuan, Philadelphia, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 17, 1973, Ser. No. 324,493The portion of the term of this patent subsequent to July 2, 1991, has been disclaimed.
Int. Cl. B32b *27/04*
U.S. Cl. 428—252 **15 Claims**

1. An acrylic adhesive coated polyimide film, at least 2 mils in thickness said polyimide film having the recurring unit:



wherein R is a tetravalent radical containing at least one ring of six carbon atoms, said ring characterized by benzenoid unsaturation, the four carbonyl groups being attached directly to separate carbon atoms in the ring of the R radical and each pair of carbonyl groups being attached to adjacent carbon atoms in the ring of the R radical; and wherein R^1 is a divalent radical containing at least two rings of six carbon atoms, each ring characterized by benzenoid unsaturation, and in which no more than one of the valence bonds is located on any one of said rings of said R^1 radical;

said acrylic adhesive being a terpolymer having 15–65% by weight of the terpolymer of acrylonitrile, methacrylonitrile, or mixtures thereof, 30–84% by weight of the terpolymer of butyl acrylate, ethyl acrylate, 2-ethylhexyl acrylate, lauryl acrylate, or mixtures thereof, and 1–15% by weight of the terpolymer of methacrylic acid, acrylic acid, itaconic acid, or mixtures thereof, said acrylic adhesive also containing a cross-linking resin selected from the group consisting of phenol formaldehyde, melamine formaldehyde and hexamethoxymethyl melamine, said resin being present in an amount of about 1–10% by weight of the terpolymer.

8. Laminate comprising the acrylic adhesive coated polyimide film of claim **1** adhered to at least one substrate selected from the group consisting of metal, woven or non-woven fabric or natural or synthetic fiber, woven or non-woven fabric or natural or synthetic fiber impregnated with polymer, paper of natural or synthetic fibers and film of polymer.

3,900,663

METHOD OF TREATING FABRICS

Eugene S. Barabas, Watchung, N.J., and Edwin M. Smolin, Easton, Pa., assignors to GAF Corporation, New York, N.Y.

Filed Apr. 11, 1973, Ser. No. 349,988
Int. Cl. B44d *1/02, 1/44;* **C08f** *29/42*
U.S. Cl. 428—254 **20 Claims**

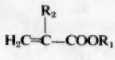
1. A process for treating knitted textile materials, comprising applying to said materials an aqueous emulsion of an interpolymer comprising approximately by weight:

a. 20 to 79% of a vinyl ester having the formula:

$$H_2C{=}CHOCOR$$

wherein R is a straight or branched chain $C_{1\text{-}18}$ alkyl radical;

b. 20 to 79% of an ester of an α,β-monoolefinically unsaturated carboxylic acid having the formula:



wherein R_1 is straight or branched lower alkyl and R_2 is hydrogen or $C_{1\text{-}8}$ alkyl;

c. 1 to 10% of an α,β-monoolefinically unsaturated carboxylic acid; and

d. 0.5 to 2% of a bifunctional monomer having the formula:

$$CH_2{=}CHCH_2RCH_2CH{=}CH_2$$

wherein R is selected from the group consisting of oxygen, an amine radical, and a dicarboxylic acid radical, and thereafter subjecting the treated knitted textile materials to curing conditions, whereby 0.1 to 5% by weight of the cured polymeric product per dry weight of the knitted textile material remains on said knitted textile materials.

3,900,664

FLAME PROOFING OF FABRICS

George T. Miller, Lewistown, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Mar. 2, 1973, Ser. No. 337,349
Int. Cl. C09d *5/18*
U.S. Cl. 428—269 21 Claims

1. Flame proofed synthetic fabric consisting essentially of a normally flammable synthetic material selected from the group consisting of poly(hexamethylene adipamide), polycaproamide, and poly(m-phenyleneisophthalamide) which material contains a flame retardant amount of a ammonium salt of phosphoric acid, selected from the group consisting of mono and diammonium acid phosphate and mixtures thereof.

21. A process for increasing the Oxygen Index of a fabric consisting essentially of a normally flammable synthetic polymer material selected from the group consisting of poly(hexamethyleneadipamide), polycaproamide, and poly(m-phenylenisophthalamine) which consists essentially of applying to said polymer material a flame retarding amount of at least one ammonium salt of phosphoric acid selected from the group consisting of mono and diammonium acid phosphate.

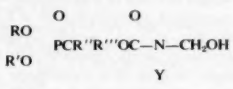
3,900,665

FLAME RETARDING OF SOLID SUBSTRATES WITH HYDROXYALKYLPHOSPHONATE CARBAMATES

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 157,699, June 28, 1971, Pat. No. 3,835,204. This application Aug. 20, 1973, Ser. No. 389,606
Int. Cl. C09d *1/00*
U.S. Cl. 428—276 16 Claims

1. A process for flame retarding a flammable, cellulosic solid substrate, said process comprising applying to the substrate an effective amount of at least one hydroxyalkylphosphonate carbamate corresponding to the formula:



where R and R′ can be the same or different and are selected from the group consisting of C_1—C_4 alkyl, allyl and C_2—C_4 mono- and dihaloalkyl groups wherein said halo substituents are chloro or bromo and are substituted upon a carbon atom which has at least one intervening carbon atom between it and the oxygen linkage, Y is H or CH_2OH and R″ and R‴ can be the same or different and are selected from the group consisting of H and C_1—C_4 alkyl groups and thereafter curing said carbamate so as to form an insoluble fire retardant finish on said substrate.

3,900,666

FLAME RETARDANT TEXTILES BY USE OF NITROGENOUS TYPE RESIN AND ANTIMONY OXIDE

Hubert H. St. Mard, New Orleans; Albert S. Cooper, Jr., and Carl Hamalainen, both of Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 4, 1974, Ser. No. 476,236
Int. Cl. C09d *1/00*
U.S. Cl. 428—290 14 Claims

1. A process for imparting flame retardancy to a blended cotton and halogen-containing synthetic textile, the process comprising:

a. impregnating a blended fabric whose composition is in the range of about from 85–15 percent to 15–85 percent by weight, respectively, of cotton and a halogen-containing synthetic textile, to about from 60 to 100 percent wet pickup with a solution containing:

1. about from 6 to 20 percent of a crosslinking and/or polymer-forming N-methylol-type resin selected from the group consisting of trimethylol melamine, methylated methylol melamine, dimethylol dihydroxy ethylene urea and propylene urea.
2. about from 1 to 8 percent of an acid type catalyst selected from the group consisting of a mixture of zinc acetate and zinc nitrate, a mixture of tartaric acid and ammonium chloride, a mixture of citric acid and magnesium chloride, ammonium chloride, and zirconium acetate; and
3. about from 1 to 20 percent of antimony oxide as a flame retardant additive; and

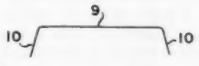
b. drying at about 2–4 minutes at about 185°F and curing the impregnated blended fabric for about 2–4 minutes at about 285°F.

3,900,667

REINFORCING WIRE ELEMENT AND MATERIALS REINFORCED THEREWITH

Joris Moens, Kortrijk, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Continuation-in-part of Ser. No. 69,623, Sept. 4, 1970, abandoned. This application Sept. 8, 1972, Ser. No. 287,236
Claims priority, application Netherlands, Sept. 12, 1969, 6913898
Int. Cl. E04c *5/00*; B32b *5/16*
U.S. Cl. 428—292 4 Claims



1. A two-phase material having increased tensile strength and resistance to crack propagation comprising:

a. a hardened matrix material,

b. a plurality of wire elements substantially uniformly distributed and randomly oriented in said matrix material so that the average distance between the centroids of each element is less than one-fourth of the wire length of each element,

c. said wire elements having a length to diameter ratio of between about 50 to 1 and 200 to 1,

d. said wire elements each comprising a substantially straight central portion having a curvature of less than about 45° and having a length of at least one-half of the total length of said element and a pair of terminal portions connected by said central portion,

e. said terminal portions comprising a substantially straight terminal part having a length of at least five times the diameter of said elements and further comprising a bending connecting said substantially straight terminal part to said substantially straight central portion,

f. said bending being around a radius curvature less than the diameter of said wire segment and forming an angle of between 90° and 135° between said terminal part and said central portion,

g. each of said terminal portions being so constructed and arranged that a normal to one of said terminal portions at every point therealong passes outside the other of said terminal portions,

h. said elements being thusly so constructed and arranged as to inhibit hooking-in of each of said elements with respect to the other of said elements.

3,900,668

INTERNAL COMPONENTS FOR GAS TURBINES OF PYROLYTIC GRAPHITE SILICON CARBIDE CODEPOSIT

Eugene L. Olcott, Falls Church, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Continuation-in-part of Ser. No. 161,007, July 9, 1971, Pat. No. 3,717,419, and a continuation-in-part of Ser. No. 65,899, Aug. 21, 1970, Pat. No. 3,738,906. This application Oct. 30, 1972, Ser. No. 301,777The portion of the term of this patent subsequent to June 12, 1990, has been disclaimed.

Int. Cl. B32b *5/10*

U.S. Cl. 428—297 **9 Claims**

1. A rotor blade, stator vane or shroud ring for a gas turbine prepared from a composite comprising of pyrolytic graphite and silicon carbide in which said pyrolytic graphite comprises layers of crystallites of pyrolytic graphite and said silicon carbide comprises codeposited crystalline aciculae embedded in said crystallites, said aciculae being oriented so that the longitudinal axes of said aciculae are substantially aligned in the c-direction relative to the a-b plane of the associated pyrolytic graphite crystallite, said silicon carbide comprising between about 5% and 95% by volume of said composite.

3,900,669

PRESSURE-SENSITIVE RECORDING SHEET WITH MICROCAPSULES HAVING POLYUREA WALLS

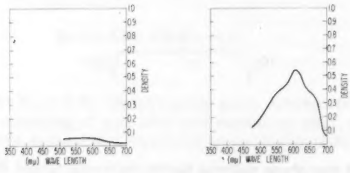
Masataka Kiritani, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami Ashigara-shi, Japan

Filed Oct. 19, 1972, Ser. No. 298,888

Claims priority, application Japan, Oct. 21, 1971, 46-83483

Int. Cl. B41m *5/00*; **B01j** *13/00*

U.S. Cl. 428—307 **23 Claims**



1. A pressure-sensitive recording sheet which comprises a base material and (1) a layer of a colorless or substantially colorless color-forming substance rendered colored upon reaction with a developer, encapsulated in walls of a polyurea obtained by the reaction of a polyisocyanate or isocyanate-containing polyisocyanate adduct with a polyamine or polyamine adduct, and (2) a layer of developer capable of giving a colored substance by reaction with said color-forming substance, layers (1) and (2) being on the same surface of said base material.

3,900,670

LAMINATED FILM STRUCTURE

Richard Masayoshi Ikeda, Chadds Ford, Pa., and Rudolph Henry Michel, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 315,561, Dec. 15, 1972, abandoned. This application Sept. 7, 1973, Ser. No. 395,251

Int. Cl. B32b *5/16, 27/08, 27/32*

U.S. Cl. 428—308 **11 Claims**

1. A film laminate consisting essentially of:

a. a biaxially stretched thermoplastic film having a cellular polymer matrix prepared from:

1. a polymer having a crystallinity of at least about 60% at room temperature taken from the group consisting of homopolymers, copolymers, and blends thereof of α-olefins having 2 to 10 carbon atoms, having dispersed therein

2. about 26 to 50 weight percent of an inert filler, based on the weight of the polymer and inert filler, having an average particle size of about 0.3 to 8 microns,

wherein the filled polymer has an elongation of at least about 1,000% at a temperature within the range which is above the line drawing temperature and below the melting temperature of the polymer, said film having at least about 30% voids, an elongation at break at 22°C. of at least about 8% in each direction of stretch and about 2 to 40 surface ruptures per square millimeter; laminated to at least one side thereof

b. a polymeric grease-proof layer of about 0.5 to 1 mil taken from the group consisting of:

1. high-density polyethylene wherein the density of the polymer is from about 0.94 to 0.98 g./cc. at 25°C.,

2. polypropylene having a crystallinity of at least about 60%, and

3. an ethylene-based ionomeric resin prepared by copolymerizing a mixture of ethylene and unsaturated monocarboxylic acid in the presence of a free radical polymerization initiator, followed by bringing the copolymer into contact with an ionizable compound to effect cross-linking forming an ionized copolymer, and

c. at least one polymeric layer taken from the group consisting of:

1. 60 to 70 parts by weight of ethylene-vinyl acetate copolymer having an ethylene content of 70 to 85 weight percent based on the weight of the copolymer present, about 20 to 25 weight percent of a wax having a melting point of at least 60°C., about 5 to 15 parts by weight of a dispersing agent of sodium-ammonium rosinates having at least 75% ammonium rosinate content, about 0.5 to 5 parts by weight of ammonium proteinate, about 1 to 10 parts by weight of a polymerized rosin ester and about 0.5 to 5 parts by weight of a stearate salt of a metal selected from Group II of the Periodic Table and having an atomic number between 12 and 30,

2. an ethylene-wax terpolymer composition comprised of 25 to 99 weight percent of a petroleum wax and 75 to 1 weight percent of a terpolymer of at least 65 weight percent ethylene, at least 5 weight percent of an ester, an alkyl acrylate or an alkyl methacrylate and about 0.1 to 3.0 weight percent of a monomeric acid selected from the group of methacrylic, acrylic, itaconic, maleic and fumaric acid,

3. an ethylene-based ionomeric resin prepared by copolymerizing a mixture of ethylene and unsaturated monocarboxylic acid in the presence of a free radical polymerization initiator followed by bringing the copolymer into contact with an ionizable compound to effect crosslinking forming an ionized copolymer,

4. low-density polyethylene wherein the density is about 0.91 to 0.93 g./cc. at 25°C., and

5. a vinylidene chloride copolymer composition.

8. The film laminate of claim **1** additionally including at least one layer of polypropylene having a crystallinity greater than 60% and containing a pigment.

3,900,671

CAPSULE-CARRYING SHEETS OR WEBS

Brian Edward Evans, Beaconsfield, England, assignor to Wiggins Teape Research & Development Limited, London, England

Filed Oct. 6, 1972, Ser. No. 295,484

Claims priority, application United Kingdom, Oct. 18, 1971, 48270/71

Int. Cl. B41c *1/06*; **B41m** *5/00*

U.S. Cl. 428—323 **9 Claims**

1. A process for producing a capsule-carrying sheet or web comprising a base sheet or web having on a surface thereof a coating comprising capsules, protective particles as protection for the capsules, and a binder for the capsules and the protective particles, wherein the protective particles are starch parti-

cles and the binder is a protein binder with the starch particles and the protein binder being both derived from a common milled flour source, which process comprises (a) treating milled flour to provide the starch particles and the protein binder, and (b) coating the starch particles and protein binder onto the base sheet or web together with the capsules.

3,900,672
PROCESS FOR COATING AN OPTICAL MATERIAL AND THE RESULTING PRODUCT

Vivan Joseph Hammond, London; Peter Norgate, Middlesex, both of England; Fumio Onoki, Tokorosawa, Japan; Hajime Kamiya, and Kazuaki Ohno, both of Tokyo, Japan, assignors to Hoya Lens Co., Ltd., Tokyo, Japan

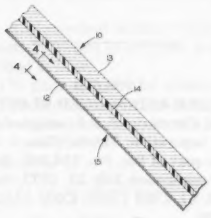
Filed Apr. 4, 1973, Ser. No. 347,824
Int. Cl. B32b *17/06;* **C03c** *17/28*
U.S. Cl. 428—334 **2 Claims**

1. A process for improving the property of the surface of an optical material by providing a coating mixture comprising 25 to 70% by weight of polyacrylic acid, 0.5 to 10% by weight of hexamethoxymethylmelamine, 0.1 to 2% by weight of γ-aminopropyl triethoxysilane, 0.01 to 0.1% by weight of polyethylene glycol fatty acid ester and 25 to 75% by weight of a solvent selected from the group consisting of 2-ethoxyethanol, ethyl alcohol, ethylene glycol, monoethyl ether and a mixed solution of two or more thereof, based on the weight of the mixture, the sum of the percentages being 100%, coating the surface of the optical material with said mixture by a spinning method and drying and hardening the coating at a heating temperature of 50°C to 150°C to form a coating having a thickness of 10μto 1,000μ.

3,900,673
AUTOMOTIVE GLAZING STRUCTURE

Paul T. Mattimoe, Toledo; Theodore J. Motter, Genoa; John J. Hofmann, Toledo, all of Ohio, and Siegfried H. Herliczek, Ottawa Lake, Mich., assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Continuation-in-part of Ser. No. 284,137, Aug. 28, 1972, abandoned. This application Sept. 13, 1974, Ser. No. 505,830
Int. Cl. B32b *17/06, 27/40*
U.S. Cl. 428—339 **10 Claims**



1. A transparent, temperature stable glazing structure for automotive vehicles that is free of apparent distortion and birefringence color and comprises the combination; with a sheet of glass that is to become the inboard glass sheet when said glazing structure is mounted and that has a second sheet of glass heat and pressure laminated to a surface thereof with an interposed layer of controlled relatively low adhesion-high penetration resistant plastic; of a relatively soft and extensible but penetration resistant protective plastic cover that includes a layer of relatively high adhesion plastic selected from the group consisting of polyvinyl butyral, ionomer resin, polyurethane and polyvinyl chloride heat and pressure laminated to the surface of said inboard glass sheet that is to become the inboard glass surface of said glazing structure, a more durable sheet of stretched plastic selected from the group consisting of polyethylene terephthalate, polyurethane, cellulose triacetate, fluorinated copolymers of ethylene and propylene, copolymers of acrylic acid esters, and polyvinyl fluoride having a thickness of 0.5 mil to 14 mils arranged with its major axis of stretch at right angles to the horizontal dimension of said glazing structure on said relatively high adhesion plastic layer, and a relatively harder abrasion resistant coating selected from the group consisting of (a) mixtures of polysilicic acid and copolymers of fluorinated monomers with compounds containing alcohol groups, and (b) hydrolysis and condensation products of methytriethoxy silane on the exposed surface of said more durable sheet of stretched plastic, the combined thickness of said interposed layer of relatively low adhesion plastic and said relatively high adhesion plastic layer not exceeding 0.065 inch, and the combined thickness of said plastic sheet and said layers not exceeding 0.075 inch.

3,900,674
INTERPOLYMERS OF ALKYL ACRYLATES, UNSATURATED CARBOXYLIC ACIDS AND UNSATURATED HYDROXYLATED AMIDES AS PRESSURE-SENSITIVE ADHESIVES AND ARTICLES THEREOF

Alfred M. Coffman, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

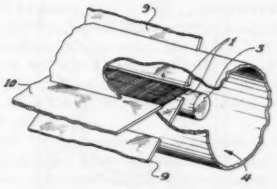
Continuation-in-part of Ser. No. 321,731, Jan. 8, 1973, abandoned, which is a division of Ser. No. 178,462, Sept. 7, 1971, Pat. No. 3,738,971. This application June 20, 1974, Ser. No. 481,063
Int. Cl. C08f *15/00*
U.S. Cl. 428—355 **7 Claims**

1. A pressure-sensitive adhesive article comprising a backing material and bonded thereto a polymer consisting essentially of (1) from about 76 percent to about 98 percent by weight of an alkyl acrylate wherein the alkyl group contains at least 6 and up to about 18 carbon atoms, (2) up to 20 percent by weight of an alkyl acrylate wherein the alkyl group contains 4 to 5 carbon atoms, (3) from about 2 percent to about 4 percent by weight of an α,β-olefinically unsaturated carboxylic acid, and (4) about 0.04 percent to about 0.15 percent by weight of an N-alkylol amide of an α,β-olefinically unsaturated carboxylic acid, all weights based upon the weight of the polymer.

3,900,675
ROCKET NOZZLE COMPRISING PYROLYTIC GRAPHITE-SILICON CARBIDE MICROCOMPOSITE INSERTS

Eugene L. Olcott, Falls Church, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Division of Ser. No. 65,899, Aug. 21, 1970, Pat. No. 3,738,906. This application Apr. 24, 1973, Ser. No. 354,048The portion of the term of this patent subsequent to June 12, 1990, has been disclaimed.
Int. Cl. B32b *5/12*
U.S. Cl. 428—367 **17 Claims**



1. Rocket nozzle insert of pyrolytic graphite microcomposite comprising pyrolytic graphite containing embedded therein codeposited silicon carbide comprising aciculae of silicon carbide, the longitudinal axes of said aciculae being

aligned in the *c*-direction relative to the *a–b* plane of the associated pyrolytic graphite crystallite at the point of embedment, said silicon carbide comprising about 5 to 95 percent by volume of said microcomposite, said insert being substantially cylindrical.

4. The rocket nozzle insert of claim **1** in which the microcomposite comprises a matrix containing embedded therein at least one reinforcing refractory filament or strand layer, said filament or strand layer comprising a plurality of unidirectional and substantially parallel, laterally spaced, individual, continuous refractory filaments or strands, said matrix comprising crystallite layers of said pyrolytic graphite-silicon carbide microcomposite nucleated from each of said individual filaments or strands and interconnected to form a continuous matrix phase surrounding and interconnecting each of said individual filaments or strands comprising said embedded at least one filament or strand layer.

3,900,676

ANTISTATIC FILAMENTS

Thomas Alderson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 752,724, Aug. 14, 1968, abandoned, which is a continuation-in-part of Ser. No. 668,951, Sept. 19, 1967, abandoned. This application Aug. 14, 1973, Ser. No. 388,137

Int. Cl. C08g *41/04;* **D02g** *3/00*

U.S. Cl. 428—372 **8 Claims**

1. A synthetic filament of a fiber-forming, linear polymer selected from the group consisting of polyamides and polyesters having durably antistatic properties due to a content of from 2–15 percent by weight of the filament of an N-alkyl polycarbonamide modifier having a molecular weight of at least about 800 to about 5000 and a bulk Log R in the dry state of less than about 10.5, said modifier being dispersed throughout the filament as a separate phase in the form of conductive, microscopic, elongated particles aligned essentially parallel to the filament axis with a length to diameter ratio of at least about 100, and wherein each alkyl substituent of said polycarbonamide contains from 2 to 18 carbon atoms, at least 40 percent of said N-alkyl polycarbonamide being extractable from said filament on boiling with isopropyl alcohol for two hours, said filament being characterized by a conductivity substantially more than 25 times that of an unmodified filament of the same polymer.

3,900,677

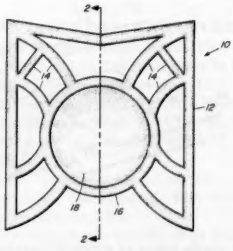
EXPANSION JOINT SEAL

Dennis G. Barber, 11916 Geib Ave., Hartville, Ohio 44632, assignor to Fox Industries, Baltimore, Md.

Filed Nov. 24, 1972, Ser. No. 309,517

Int. Cl. E01c *11/10*

U.S. Cl. 428—373 **6 Claims**



1. An expansion joint seal for sealing a joint between spaced sections, comprising:

a resilient outer shell for engaging adjacent surfaces of the spaced sections;

a resilient inner shell;

a sponge-like core held within the inner shell and being contiguously surrounded thereby for providing outwardly directed forces, the sponge-like core being composed of a material which is substantially crystallization free and capable of maintaining resiliency over a wide environmental temperature range; and,

a plurality of web-like ribs disposed between the inner and outer shells, the ribs extending substantially radially from the inner shell toward the outer shell and being affixed to the interior surfaces of the outer shell and to the exterior surfaces of the inner shell, the ribs transmitting the outwardly directed forces of said core to the outer shell to urge said outer shell into sealing engagement with the spaced sections.

3,900,678

COMPOSITE FILAMENTS AND PROCESS FOR THE PRODUCTION THEREOF

Itsuho Aishima; Noboru Fukuma; Hisaya Sakura; Hiroshi Chayamiti; Toshio Okamoto; Yuzuru Doi, and Hiroshi Henmi, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 588,332, Oct. 21, 1966, abandoned. This application July 20, 1970, Ser. No. 64,020

Claims priority, application Japan, Oct. 23, 1965, 40-64794; Feb. 25, 1966, 41-11104

Int. Cl. D02g *3/02*

U.S. Cl. 428—374 **3 Claims**

1. A composite filament comprised of two components disposed in side-by-side relationship or eccentric sheath-core relationship, a first component being crystalline polypropylene homopolymer and a second component being selected from the group consisting of a random copolymer of propylene and 0.5 to 20 mole % of another olefin and a block copolymer of propylene and 1.0 to 40 mole % of another olefin, said other olefin of the copolymer being selected from the group consisting of ethylene, butene-1, hexene-1, octene-1, 4-methylpentene-1, 3-methylbutene-1 and styrene, said composite filament having a crimp-developing force of more than 15 %.

3,900,679

GLASS FIBER REINFORCED ELASTOMERS

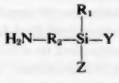
Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 154,098, June 17, 1971, abandoned. This application July 23, 1973, Ser. No. 381,456

Int. Cl. C08f *15/40;* **C03c** *25/02*

U.S. Cl. 428—378 **15 Claims**

1. Glass fibers having a thin coating thereon, said coating comprising a terpolymer formed by the interpolymerization of butadiene, styrene and an amino silane having the formula



wherein Z is hydrogen or a readily hydrolyzable group, R_1 is alkenyl, R_2 is a divalent organic group selected from the group consisting of alkylene, arylene and cyclohexylene and Y is selected from the group consisting of R_1, R_2 and Z, or the corresponding silanols and siloxanes, with the terpolymer containing 60 to 80% by weight of butadiene, 5 to 40% by weight of styrene and 0.1 to 40% by weight of the amino silane.

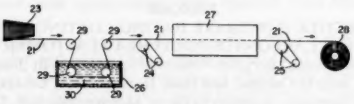
3,900,680
CORD FOR EXTENSIBLE BELT

Sidney R. Fix, Lincoln, Nebr., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 232,833, March 8, 1972, abandoned, which is a division of Ser. No. 26,457, March 5, 1970, Pat. No. 3,666,584, which is a division of Ser. No. 739,674, June 25, 1968, Pat. No. 3,566,706. This application Nov. 19, 1973, Ser. No. 417,316

Int. Cl. F16g 1/00

U.S. Cl. 428—378 4 Claims



1. A heat-treated textile cord of the type for reinforcing power transmission belts and comprised of filaments of synthetic thermoplastic material selected from at least one of the group consisting of nylon and polyester, said cord produced by the method consisting of heat-treating the cord while in a relaxed state for an interval of time of from about 60 seconds to about 180 seconds and at a temperature of from about 350°F to about 480°F and simultaneously relaxing the cord from about 1 to about 3% of its original length.

3,900,681
INSULATED ELECTRICAL CONDUCTOR

Robert Bruce Walters, Oxford, Conn., assignor to General Electric Company, New York, N.Y.

Filed Aug. 22, 1973, Ser. No. 390,618

Int. Cl. H01b 3/44

U.S. Cl. 428—379 4 Claims

1. An electrical conductor having a dielectric polymeric insulation resistant to flow and dripping at flame temperatures, comprising a metal conductor insulated with a cross-link cured polymeric composition comprising, in relative parts by weight:

100 parts of ethylene-vinyl acetate copolymer comprising 70 to 95 parts by weight of ethylene and 30 to 5 parts by weight of vinyl acetate;

about 25 to 150 parts of hydrated alumina;

about 2 to 25 parts of silicone elastomer having a viscosity in excess of about one million centipoises;

and about 2 to 10 parts of an organo tertiary peroxide curing agent.

3,900,682
PREPARATION OF CHEMICALLY CONVERTIBLE TAPE

Lynn J. Taylor, Haslett, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 189,449, Oct. 14, 1971, Pat. No. 3,816,162. This application Mar. 8, 1973, Ser. No. 339,278

Int. Cl. B44d 1/02

U.S. Cl. 427—386 7 Claims

1. A process for preparing a tape which comprises preparing a mixture of a pyrolyzable polymeric binder, a solvent for said binder and a polymerizable organic member, said pyrolyzable polymeric binder being solid at a temperature of about 40°F. to about 120°F. and said polymerizable organic member being polymerizable at or above the pyrolyzing temperature of the binder;

applying said mixture to a surface;

and drying said mixture at a temperature between about 0°C. and 200°C.

3,900,683
AZIDOFORMATES AND THEIR USE

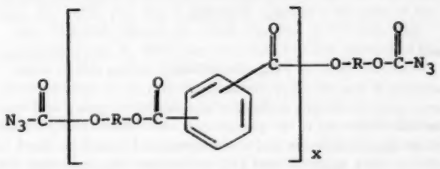
James N. Haynes, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 231,741, March 3, 1972, Pat. No. 3,814,657, which is a division of Ser. No. 93,399, Nov. 27, 1970, Pat. No. 3,686,231, which is a continuation-in-part of Ser. No. 887,382, Dec. 22, 1969, abandoned. This application Dec. 18, 1973, Ser. No. 425,906

Int. Cl.² E06B 3/12

U.S. Cl. 428—409 2 Claims

1. An article of manufacture comprising polyester material, at least one surface of which has been modified by contacting with an omega-hydroxyalkyl phthalate azidoformate having the formula



where R is an alkylene radical containing 2 to 10 carbon atoms and x is an integer from 1 to 10 and heating the thus contacted polyester material to a temperature sufficient to substantially decompose the azidoformate groups on the omegahydroxyalkyl phthalate azidoformate.

3,900,684
METHOD OF FORMING A FLUOROCARBON POLYMER CONTAINING COATING ON A SUBSTRATE

John Wilmar Edwards, Welwyn Garden City, and Barry William Farrant, St. Neots, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 4, 1973, Ser. No. 367,004

Claims priority, application United Kingdom, June 9, 1972, 27011/72

Int. Cl. C08f 3/24; B32b 15/08

U.S. Cl. 428—421 9 Claims

1. A method of forming a fluorocarbon polymer-containing coating on a substrate comprising applying to a substrate, an aqueous composition having a polytetrafluoroethylene polymer or copolymer dispersed therein and an aluminum hydroxychloride as an adhesive dissolved therein, and heating the composition on the substrate sufficiently to remove volatile components therefrom and to form a layer on the substrate the weight of the polymer or copolymer having from 10 to 50 grams per 100 grams of composition and weight of aluminum provided by the aluminum hydroxychloride being at least 3 grams per 100 grams of the polymer or copolymer.

3,900,685
CELLULOSE-POLYMER COMPOSITES

Norman G. Gaylord, New Providence, N.J., assignor to Champion International Corporation, New York, N.Y.

Division of Ser. No. 32,736, April 28, 1970, Pat. No. 3,765,934. This application Mar. 22, 1973, Ser. No. 343,921

Int. Cl. B32b 21/08; B27k 3/50; B44d 1/26

U.S. Cl. 428—420 14 Claims

1. A process for the preparation of a laminate which comprises impregnating at least two sheets of porous, cellulosic material with a polymerizable equimolar complex of styrene and maleic anhydride, superimposing said sheets on one another and thereafter subjecting said complex in situ to non-catalytic polymerization, the anhydride groups in the resultant polymer reacting with cellulosic hydroxyl groups whereby bonds are formed between the polymer and said cellulosic material.

3,900,686

ADHESION CONTROL FOR SAFETY GLASS LAMINATES

Vernon G. Ammons, Glenshaw, and James C. Vanek, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 3, 1973, Ser. No. 403,138
Int. Cl. B32b 27/00
U.S. Cl. 428—425 11 Claims

1. An energy absorbing laminate comprising a transparent, thin, energy absorbing layer of a polyurethane composition bonded on at least one of its major surfaces to a glass sheet, said composition containing (a) an organic phosphorous acid selected from the class consisting of

$$R_m—P(=O)—(OH)_p$$

and

$$R_m—P—(OH)_p$$

wherein R may be alkyl containing from 1 to 18 carbon atoms, aryl, alkaryl, alkoxy, aryloxy or an alkaryloxy group and may be linked directly to the phosphorus atom or linked by means of an oxygen atom, m and p are integers of from 1 to 2 and m plus p must equal 3, and (b) an organic silane having the structural formula:

$$(R)_m—Si—(X)_n$$

wherein m and n are whole integers of from 1 to 3 and m plus n is equal to 4, wherein X is a group which can hydrolyze to yield a hydroxyl group and R is an organic moiety selected from the class consisting of alkyl groups containing from 1 to 5 carbon atoms, aryl, vinyl and epoxy containing organic moietics present in amounts sufficient to control the degree of adhesion of the polyurethane to the glass such that the polyurethane layer is adhered to the glass sheet with a degree of adhesion of about 1 to 10 pounds per lineal inch, and this degree of adhesion being maintained when the laminate is subjected to 100 percent relative humidity at 120°F. for 5 days; the organic phosphorus acid and the organic silane being present in the polyurethane composition in concentrations of about 0.01 to 0.30 percent by weight and 0.05 to 0.5 percent by weight, respectively, based on total weight of the polyurethane composition and the weight ratio of organic phosphorus acid to organic silane being within the range of 0.05 to 0.80 inclusive.

3,900,687

PROCESS FOR COATING A SURFACE AND THE COATED SURFACE

Arthur L. Meader, Jr., Berkeley, and William L. Runyon, Jr., Richmond, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sept. 10, 1973, Ser. No. 396,042
Int. Cl. E01c 7/35; B44d 1/14
U.S. Cl. 428—425 15 Claims

12. A process for coating a surface comprising:

A. Applying a primer to a surface to be coated to promote adhesion,

B. Applying a seal coat to said primed surface, said seal coat comprising 10 to 40 parts by weight of a polyurethane precursor, 2 to 10 parts by weight of a dark heat-absorbing filler, and 25 to 75 parts by weight of a substantially inert nonvolatile extender selected from the group consisting of cut-back asphalts and extender oils, 0 to 25 parts by weight of a volatile solvent, and 10 to 40 parts by weight of an inert filler, wherein said polyurethane precursor comprises 8 to 34 parts by weight of a high-molecular-weight polyol and 0 to 8 parts by weight of a low-molecular-weight chain stiffener,

C. Allowing said seal coat to stand for a time sufficient to allow entrained gases to escape from said seal coat and said primed surface,

D. Applying to the surface of seal coat a membrane-forming coating comprising (1) 15 to 60 parts by weight of a polyurethane precursor, (2) 20 to 80 parts by weight of a substantially inert nonvolatile extender selected from the group consisting of cut-back asphalts and extender oils, (3) 6 to 20 parts by weight of a polyisocyanate, (4) 0 to 20 parts by weight of a volatile solvent, and (5) 0 to 1.0 part by weight of a polyurethane-forming reaction catalyst, wherein said polyurethane precursor comprises 15 to 60 parts by weight of a high-molecular-weight polyol and 2 to 10 parts by weight of a low-molecular-weight chain stiffener.

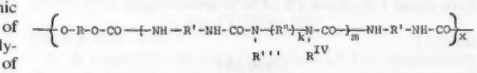
3,900,688

TEXTILE SUBSTRATE HAVING COATINGS OF POLYCARBONATE-POLYUREA ELASTOMER

Wilhelm Thoma, Bergisch-Neukirchen; Klaus Noll; Josef Pedain, both of Cologne, and Hans Joachim Koch, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 23, 1973, Ser. No. 408,977
Claims priority, application Germany, Oct. 25, 1972, 2252280
Int. Cl.² B32B 27/40
U.S. Cl. 428—246 6 Claims

1. Laminates comprising a textile substrate which is a woven or knitted fabric or fleece and having bonded thereto a bonding coat and a top coat of an aliphatic, segmented polycarbonate-polyurea elastomer of the general formula:



in which R is the group

$-(A—O—CO—O)_n A—$

where A is

$-(CH_2—CH_2—O)_p CH_2—CH_2—$

or

$-(CH_2)_q-$,

and

$p = 2–7$

$[q = 6,7]$ $q = 6$ or 7

$n = 2–40$

and in which

R′ and R″ are the same or different and represent divalent C_4-C_{18} aliphatic and/or C_5–C_{20} cycloaliphatic radicals,

R‴ and R^{IV} is H or C_1–C_6 aliphatic radicals,

$k = 0$ or 1,

$m = 0–4$, and

$x = 5–200$

and wherein at least 20 mol percent of the aliphatic and cycloaliphatic groups are cycloaliphatic, with the proviso that in the top coat A is 0–40% by weight $—CH_2—CH_2—O)_p C-H_2—CH_2—$ and [40-100%] 60–100% by weight $—CH_2)_q$.

3,900,689

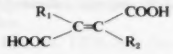
SUBSTRATES TREATED WITH CHROMIUM(III) COMPLEXES TO INCREASE THE ADHESION OF ORGANIC POLYMERS THERETO

Alden J. Deyrup, West Chester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 210,833, Dec. 22, 1971, Pat. No. 3,787,326, which is a continuation-in-part of Ser. No. 119,608, March 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 25,097, April 2, 1970, abandoned. This application June 25, 1973, Ser. No. 373,145
Int. Cl. B32b 15/04, 17/06, 27/06
U.S. Cl. 428—432 30 Claims

15. A composite article comprising a metal or metal oxide or glass substrate having bonded thereto an organic polymer

through a thin layer of the composition comprising one or more water-soluble coordination complexes of (a) chromium (III) derived from a water-soluble salt thereof with a noncoordinated anion, which salt yields $Cr(H_2O)_6^{3+}$ in water; with (b) a trans-acid of the formula



wherein R_1 and R_2 are the same or different and are H, alkyl, $-CH_2COOH$ or phenyl; provided that the total number of carbon atoms in said trans-acid is an integer in the range 4–10, inclusive, said composition being selected from the group consisting of

a. complexes whose aqueous solutions have a purple-blue color and give a characteristic broad band light absorption spectrum having maxima at about 5750 A and 4120 A, said noncoordinated anion being nitrate (Type I);

b. complexes whose aqueous solutions have a clear medium green color and give a characteristic broad band light absorption spectrum having maxima at about 5850 A, 4300 A and 3620 A (Type II); and

c. complexes whose aqueous solutions have a blue color and give a characteristic broad band light absorption spectrum having maxima at about 5700 A and 4120 A, said noncoordinated anion being nitrate (Type III).

3,900,690

PROCESS FOR THE PRODUCTION OF DIMENSIONALLY STABLE, PLANAR MATERIALS COATED ON ONE SIDE

Günther Schwarz, Hiltrup, Germany, assignor to Glasurit Werke M. Winkelmann GmbH

Continuation of Ser. No. 264,588, June 20, 1972, abandoned. This application May 13, 1974, Ser. No. 469,292

Claims priority, application Germany, July 2, 1971, 2132925

Int. Cl.[2] **B05C** *9/04*; **B44D** *1/02*

U.S. Cl. 428—447 **5 Claims**

1. A method for producing a dimensionally stable porous cellulosic substrate by impregnating the uncoated side opposite to that bearing a moistureproof impermeable surface coating with silicone fluids, and drying said coating, the improvement comprising applying to said uncoated side of said substrate a solution containing 90 – 97 percent by weight of a solvent selected from the group consisting of organic hydrophilic solvents or solvents containing not less than 10 percent of said hydrophilic solvents and 3 – 10 percent by weight silicone fluid having a viscosity of 0.65 – 1,000,000 centistokes and a molecular weight between about 600 – 400,000.

3,900,691

METHOD OF COATING A POLYOLEFIN SURFACE AND THE COATED ARTICLE

Oren L. Marrs, and Larry P. Mozer, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 279,099, Aug. 9, 1972, abandoned. This application June 13, 1974, Ser. No. 479,124

Int. Cl. B32b *27/32*; **B65d** *23/02*

U.S. Cl. 428—451 **9 Claims**

4. A polyolefin article having a multilayer coating on the surface thereof to reduce permeability, said coating comprising:

a primer coating in contact with the polyolefin article surface, said primer coating comprising a tackifier and a copolymer of at least one conjugated diene of 4 to 12 carbon atoms and at least one monovinyl-substituted aromatic hydrocarbon, said diene and aromatic hydrocarbon being in a weight ratio of 60/40 to 85/15, said copolymer being a block copolymer of the form $(A\text{-}B)_xY$, where each A is a nonelastomeric polymer segment, each B is an elastomeric polymer segment, Y is an atom or group of atoms derived from a polyfunctional compound having at least 3 reactive sites, and x is an integer of at least 3; and a barrier coating in contact with the primer coating, said barrier coating comprising a polymer of vinyl chloride of vinylidene chloride or a copolymer of vinyl chloride and vinylidene chloride.

3,900,692

METHODS FOR MODIFYING ASPHALTS AND EMULSIONS USEFUL THEREFOR

Fritz S. Rostler, Berkeley, Calif., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 142,067, May 10, 1971, Pat. No. 3,769,246, which is a continuation-in-part of Ser. No. 108,596, Jan. 21, 1971, Pat. No. 3,763,074, which is a division of Ser. No. 714,424, March 30, 1968, Pat. No. 3,577,250. This application Jan. 8, 1973, Ser. No. 321,571The portion of the term of this patent subsequent to May 4, 1988, has been disclaimed.

Int. Cl.[2] **B44D** *1/09*; **C09D** *3/48, 11/10*

U.S. Cl. 428—489 **16 Claims**

1. A method of treating asphalt in an asphalt-aggregate structure, said method comprising impregnating said asphalt-aggregate structure by applying to the surface thereof an oil-in-water emulsion, the oil phase being from about 10 to about 80% by weight of the emulsion containing polymer having an average molecular weight in the range above 10,000, said polymer being substantially insoluble in normal pentane, said polymer being in solution in said oil, at a polymer concentration of about 2 to about 25% by weight of said oil, said asphalt and said polymer being mutually soluble in said oil, said oil having an initial boiling point which is not substantially below about 300° C. at 760 mm. Hg., and said oil being substantially free of asphaltenes and substantially soluble in n-pentane.

5. The method of rubberizing asphalt in an asphalt-aggregate pavement, said method comprising impregnating said asphalt pavement by applying to the surface thereof an oil-in-water emulsion, the oil phase being from about 10 to about 80% by weight of the emulsion containing a dissolved elastomer, substantially insoluble in n-pentane, in an amount ranging between about 2 to about 25% by weight of said oil, said oil having an initial boiling point which is not substantially below about 300° C. at 760 mm Hg., said oil being substantially free of asphaltenes and substantially soluble in n-pentane and said elastomer and said asphalt being mutually soluble in said oil, the quantity of said emulsion applied to said asphalt being sufficient to incorporate said elastomer in said asphalt to at least about 0.1% by weight of the said asphalt.

9. A method of treating asphalt which comprises applying to said asphalt an oil-in-water emulsion comprising as an oil phase, a solution in oil of a polymer or mixture of polymers which are substantially soluble in n-pentane and a polymer or mixture of polymers which are substantially insoluble in n-pentane at a polymer concentration of about 2 to about 25% by weight of the oil, said oil having solvent properties for asphalt and for pentane-soluble polymers and pentane-insoluble polymers, the ratios of the polymers are from 9 parts by weight of polymer which are substantially insoluble in n-pentane to 1 part by weight of polymers which are substantially soluble in n-pentane to a ratio of 1 part by weight of the polymers substantially insoluble in n-pentane to 9 parts by weight of the polymers which are substantially soluble in n-pentane.

12. The method of treating an asphaltic surface which comprises applying to said surface of an oil in water emulsion comprising an oil phase consisting essentially of an oil having an initial boiling point which is not substantially below 300° C. at 760 mm. Hg and is substantially free of asphaltenes and is substantially soluble in normal pentane and having solvent properties for asphalt, a mixture of compatible polymers dissolved in said oil phase, said polymers being in concentration of about 2 to about 25% by weight based on said oil phase and

a cationic emulsifier, said polymers including a mixture of a polymer which is substantially insoluble in n-pentane and a polymer which is substantially soluble in n-pentane in weight ratio to each other in the range of 9:1 to 1:9.

3,900,693
DIELECTRIC RESINS

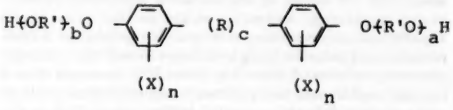
John R. Wyhof, Newark, Del., assignor to ICI United States Inc., Wilmington, Del.

Division of Ser. No. 362,540, May 21, 1973, Pat. No. 3,865,789. This application Oct. 10, 1974, Ser. No. 513,890
Int. Cl.[2] B05D *5/12*; **G03G** *5/04*
U.S. Cl. 428—511 **10 Claims**

1. An electrographic recording element comprising a base support having coated thereon a layer of a dielectric resin said resin comprising the reaction product of

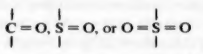
a. a dicarboxylic acid or an anhydride thereof, provided that at least 80 mol percent of said acid or anhydride is an alpha unsaturated dicarboxylic acid, an anhydride thereof, an aromatic dicarboxylic acid or an anhydride thereof, and

b. a polyol blend comprising a first polyol having the following formula:



wherein

R is an alkylidene group containing from 1 to 4 carbon atoms, a cycloalkylidene group containing 5 or 6 carbon atoms, oxygen, sulfur, or a radical having one of the following formulas:



c is 0 or 1;

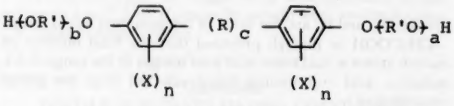
X is halogen or an alkyl radical containing from 1 to 3 carbon atoms;

n is an integer equal to from 0 to 4;

R′ is an alkylene group containing from 2 to 4 carbon atoms or the radical $CH_2CH\phi$; and

a and *b* are integers each of which is equal to at least 1 and the sum of which is equal to about 2, provided that the sum must be equal to at least 2.0

and a second polyol having the following general formula:



wherein R, *c*, X, R′, and *n* are as defined above and *a* and *b* are integers each of which is equal to at least 1 and the sum of which is equal to from about 4 to about 16,

wherein the amount of acid or anhydride employed is sufficient to introduce from about 0.8 to about 1.2 carboxyl groups per hydroxyl group in the polyol blend.

3,900,694
HOT MELT ADHESIVE CONTAINING AMORPHOUS POLYPROPYLENE

Lawrence D. Jurrens, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 148,221, May 28, 1971. This application Aug. 30, 1972, Ser. No. 284,836
Int. Cl. B32b *21/06*
U.S. Cl. 428—513 **7 Claims**

1. A laminate exhibiting good bond strength at crosshead speeds of 0.2 inches per minute as tested by ASTM D 1876-61T comprising at least two porous strata bonded by a distinct interlayed stratum of a hot melt adhesive consisting of (1) 25 to 35 percent by weight amorphous polypropylene having a molecular weight range of 500 to 15,000; (2) 35 to 45 percent by weight of crystalline olefin copolymer of 95 to 98 percent by weight polypropylene and 5 to 2 percent by weight ethylene; and (3) 40 to 20 percent by weight of a polyterpene tackifier.

3,900,695
ELECTRIC INDUCTION FURNACE

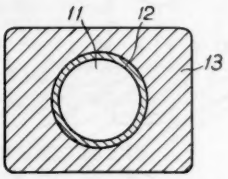
Conny Andersson, Viken; Bertil Hanås, Vasteras; Torsten Körsell, and Jan Nilsson, both of Robertsfors, all of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed May 16, 1974, Ser. No. 470,604

Claims priority, application Sweden, May 18, 1973, 7307026

Int. Cl.² H05B *5/12*

U.S. Cl. 13—26 **1 Claim**



1. An electric induction furnace having a crucible for containing a metal melt and an electric induction coil for inductively heating a melt in said crucible, said coil being a coiled tubular conductor through which a cooling liquid can be flowed; wherein the improvement comprises said conductor having inner and outer metal layers, said inner layer being a metal selected from the class consisting of copper and copper alloy, and the outer layer being some other metal and which is substantially free from copper, said other metal being a metal selected from the class consisting of aluminum and aluminum alloy, said layers having integrated interfaces substantially free from electrical resistance.

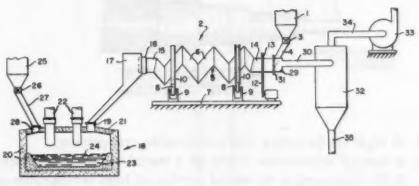
3,900,696
CHARGING AN ELECTRIC FURNACE

Jack E. Tress, and Willard I. Hunter, both of Albany, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Division of Ser. No. 450,636, March 13, 1974. This application Aug. 26, 1974, Ser. No. 500,797

Int. Cl.² F27D *3/08*

U.S. Cl. 13—33 **8 Claims**



1. Apparatus for melting and refining particulate metals which comprises:

an electric furnace closed to the atmosphere;

conduit means communicating between the interior of the electric furnace and the discharge end of a rotating feeding device, said feeding device comprising an unobstructed tubular container of undulant shape disposed with its longitudinal axis in a substantially horizontal attitude and rotatable about that axis;

means to introduce particulate metal charge material into the end of said container opposite said discharge end;

means to rotate said container about its longitudinal axis to thereby advance said charge material through said container, and

means to withdraw gases produced within said electric furnace through said conduit means and through said feeding device in counterflow relationship to said advancing charge material.

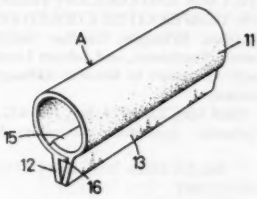
3,900,697
ELECTRIC WIRE INSULATING COVER

Masamitsu Yotsugi, No. 1-9, 5-chome Fukata-cho, Naka-ku, Kobe-shi, Hyogo-ken, Japan

Filed May 2, 1974, Ser. No. 466,128

Int. Cl.² H01B *17/58*

U.S. Cl. 174—5 R **1 Claim**



1. A covering arrangement for insulating electric wires comprising an elongated inwardly resilient flexible cylindrical body split along its length so as to provide two longitudinal straight edges, sized to hold an electric wire therein, so constructed that the two longitudinal edges overlap, and two straight longitudinal projections extending outwardly from said cylindrical body each situated a different short distance from one of said longitudinal straight edges, said projections touching each other at the outer ends thereof but separated at the inner ends so as to from a triangular space between the two projections.

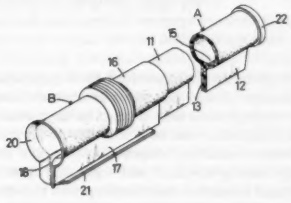
3,900,698
ELECTRIC WIRE INSULATING COVER

Sanji Yotsugi, No. 3-19, Umeno-cho, Takarazuka-shi, Japan

Filed May 2, 1974, Ser. No. 466,129

Int. Cl. H02g *1/02;* **H01b** *17/00*

U.S. Cl. 174—5 R **1 Claim**



1. An electric wire insulating arrangement comprising in combination:

a. an elongated flexible split cylindrical body (**11**) with two lateral projections (**12, 13**) disposed to face each other in parallel with a small clearance therebetween, one of said projections (**12**) comprising an extension of a first outer wall as well as an inner cylindrical wall portion, the other projection (**13**) extending outward from a second outer cylindrical wall portion of which the inner portion continues spirally inwards to overlap the first wall portion, an

outer flange edge (**22**) at least at one end of said cylindrical body; and,

b. a longitudinally flexible split cylindrical coupling (**16**) of a diameter slightly larger than the outer diameter of said body (**11**) with two lateral coupling projections (17, **18**) forming extensions of the cylindrical wall and with a frustro-conical opening at one end, said coupling projections being so spaced and said opening so sized that said body (**11**) can pass therethrough, a groove (19) in said coupling receiving said flange edge (**22**) and holding it firmly therein, and a longitudinal protective piece (**21**) attached to one of said coupling projections (**18**) and extending over to the other projection (**17**) disposed to cover the clearance therebetween, said body (**11**) and coupling (**16**) when nested one in the other forming a protecting covering for a wire.

3,900,699

HIGH-VOLTAGE AND COOLANT FEED APPARATUS FOR LOW TEMPERATURE COOLED CONDUCTORS

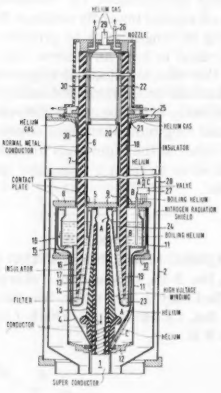
Peter Penczynksi, Erlangen; Gunther Matthaus, Spardorf; Peter Massek, Forchheim, and Johann Liendl, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 23, 1974, Ser. No. 472,684

Claims priority, application Germany, May 30, 1973, 2327628

Int. Cl. H01b *7/34*; **H01v** *11/00*

U.S. Cl. 174—15 BH **17 Claims**



1. In a high-voltage and coolant feed apparatus including low temperature cooled electrical conductors disposed in a concentric arrangement with respect to each other, and each of which is coupled to one of a plurality of normally conductive electrical conductors disposed in the gas stream of an evaporating cooling medium and separated from each other by an electrical insulation member disposed therebetween, the improvement comprising a first vessel having an open end and containing a coolant into which one end of said electrical insulation member extends, said vessel comprising an inner hollow cylindrical shell and an outer hollow cylindrical shell concentrically disposed about said shell with said inner shell being fabricated of electrical insulation material, with at least one inner low temperature conductor extending through an inner space formed by said inner shell and being coupled to an inner normally conductive conductor, and at least one outer low temperatue cooled conductor being coupled to an outer normally conductive conductor externally of said insulation member.

3,900,700

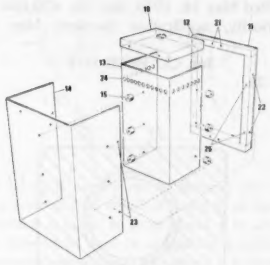
PROTECTIVE ENCLOSURE

Fernand W. Gaudet, Mount Royal, Canada, assignor to Canadian Marconi Company, Montreal, Canada

Filed Feb. 4, 1974, Ser. No. 439,361

Int. Cl. H05k *7/20*

U.S. Cl. 174—16 R **1 Claim**



1. A protective enclosure for electronic or other equipment comprising a rigid back plate provided with means for mounting the back plate and for mounting the protected equipment on the back plate and for mounting shields to the back plate; inner and outer metal shields held together as one unit by rivetting and held apart to allow for air circulation by spacers; a metal cover complete with vertical lip which fits over the inner shield and is welded to the back plate; ventilation holes cut in the inner shield below the top cover lip with the top cover in place.

3,900,701

HIGH TEMPERATURE ELECTRICAL CABLE

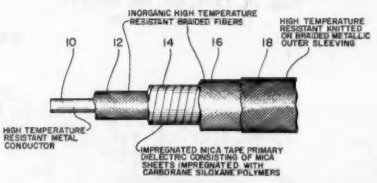
Francis Derrick Bayles, Montreal; Michael Alan Dudley, Beaconsfield, and John C. Metzler, Pierrefonds, all of Canada, assignors to Canada Wire and Cable Limited, Toronto, Canada

Filed July 15, 1974, Ser. No. 488,409

Claims priority, application Canada, June 21, 1974, 203090

Int. Cl. H01b *7/18*, *3/04*

U.S. Cl. 174—102 R **19 Claims**


INORGANIC HIGH TEMPERATURE RESISTANT BRAIDED FIBERS
HIGH TEMPERATURE RESISTANT KNITTED OR BRAIDED METALLIC OUTER SLEEVING
10
12
14
16
18
HIGH TEMPERATURE RESISTANT METAL CONDUCTOR
IMPREGNATED MICA TAPE PRIMARY DIELECTRIC CONSISTING OF MICA SHEETS IMPREGNATED WITH CARBORANE SILOXANE POLYMERS

1. A high temperature electrical cable comprising:

a. a central conductor made of a metal capable of essentially maintaining its useful service at high temperatures;

b. a covering of electrical insulating material applied over said conductor and consisting of at least one inner layer of inorganic high temperature material providing essentially complete coverage of said conductor and a smooth base for subsequent layers, at least two layers of primary dielectric material consisting of impregnated mica tapes made of reconstituted mica sheets impregnated with carborane siloxane polymers, and at least one outer layer of inorganic high temperature material over said impregnated mica tapes; and

c. an outer layer protective sleeving applied by knitting or braiding over said outer layer of inorganic high tempera-

ture material and consisting of at least one high temperature resistant metal wire.

3,900,702

RIBBON-SHAPED CONDUCTOR ARRANGEMENT FOR SUPERCONDUCTORS WHICH PERMITS EASE OF COOLING

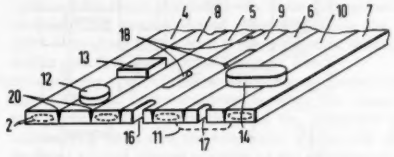
Cord Albrecht, Erlangen, and Hans Lamatsch, Nuremberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 27, 1973, Ser. No. 419,232

Claims priority, application Germany, Nov. 30, 1972, 2258703

Int. Cl. H01v *11/00;* **H01b** *5/00*

U.S. Cl. 174—126 CP **11 Claims**



1. In a ribbon-shaped conductor which comprises a plurality of individual conductors made of electrically normal conducting metals which are arranged side-by-side and welded together, with some but not all of the individual conductors having embedded therein superconductors wherein the improvement comprises forming at least some of the individual conductors not containing superconductors so that at least portions of said individual conductors are of a different thickness than that of the individual conductors containing said superconductors.

3,900,703

TRAINING SIMULATORS FOR SUBMARINE PERISCOPES

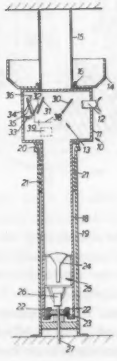
John Edward Tickle, Heald Green, England, assignor to Ferranti Limited, Hollinwood, England

Filed Aug. 30, 1973, Ser. No. 392,926

Claims priority, application United Kingdom, Aug. 30, 1972, 40165/72

Int. Cl. H04n *7/18*

U.S. Cl. 178—6 **12 Claims**



1. A training simulator for a submarine periscope located in a room having a floor and a ceiling and including a viewing station containing optical focussing and range finding apparatus, a hollow periscope tube in fixed relationship with, and extending downwardly from, the viewing station, a hollow support column fixed to the floor, extending between the floor and the viewing station and enclosing the periscope tube, bearing means arranged to support the periscope tube within the support column, said bearing means being arranged to permit rotation of the viewing station and periscope tube about the longitudinal axis of the support column, and a television monitor located within the periscope tube and arranged to provide a scene for the viewing station.

3,900,704

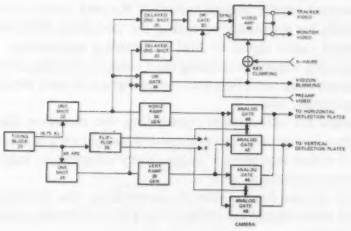
ARBS TV TRACKER

Virgil E. Thomas, Jr., and Donald G. Quist, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 31, 1972, Ser. No. 278,492

Int. Cl.[2] H04N *3/16*

U.S. Cl. 178—6.8 **2 Claims**



1. A television tracking system comprising:

a television camera tube providing a video output;

a platform on which said camera tube is mounted; and

processing means for processing said video output and providing an output that is coupled to, for controlling, said platform and an output that is the system output, comprising

means coupled to said video output for amplifying said video output

and controlling the scan and scan mode of said tube, including

a timing clock for establishing the timing rate of said amplifying and controlling means,

horizontal and vertical ramp generators coupled to at least one output of said timing clock, and

first switching means coupled to the outputs of said ramp generators for selectively applying the output of said horizontal ramp generator to the horizontal deflection plates, and, the output of said vertical ramp generator to the vertical deflection plates, of said tube, and the output of said horizontal ramp generator to the vertical deflection plates, and the output of said vertical ramp generator to the horizontal deflection plates, of said tube, and

means coupled to said amplifying and controlling means for generating signals descriptive of the error with which the system is tracking a target of interest and providing said error signals to said platform;

wherein said television camera tube has a first scan and a second scan and said second scan is at right angles to said first scan; and

wherein said processing means includes components which are used to process both the video output associated with said first scan and the video output associated with the second scan.

3,900,705
DUAL DIGITAL VIDEO SWITCHER

Ian A. Richter, Cocoa Beach, Fla., assignor to The United States of America as represented by The National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Sept. 25, 1973, Ser. No. 400,467
Int. Cl.[2] H04N *7/18*
U.S. Cl. 178—6.8 **9 Claims**

1. a system for manually and automatically coupling video signals from a plurality of cameras to a monitoring apparatus comprising:

a. a video switching circuit,

b. means for coupling said plurality of video signals to said video switching circuit,

c. means for coupling said monitoring apparatus to said switching circuit,

d. manual select means coupled to said video switching circuit for manually selecting the coupling of a predetermined video signal to said monitoring apparatus,

e. scanning means activating said video switching circuit for sequentially coupling said video signals to said monitoring apparatus, and

f. means for selectively controlling the duration that said video signals are coupled to said monitoring apparatus as said video signals are sequentially coupled to said monitoring apparatus, and

g. said means for selectively controlling the duration that said video signal are coupled to said monitoring apparatus includes

i. a shift register

ii. means for selectively triggering said shift register for producing pulses at a first and second rate for selectively controlling the duration that said video signals are coupled to said monitoring apparatus,

whereby a plurality of video signals can be monitored both manually and automatically sequentially with the duration that said video signals are coupled to said monitoring apparatus being selectively controlled.

3,900,706
METHOD OF GENERATING MONITORABLE VIDEO INFORMATION FROM RECORDINGS ON RECORD MEMBERS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

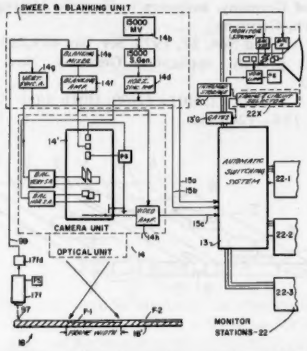
Continuation-in-part of Ser. No. 746,504, July 22, 1968, Pat. No. 3,804,978, which is a continuation of Ser. No. 347,999, Feb. 26, 1964, which is a continuation-in-part of Ser. No. 765,401, Oct. 6, 1958, abandoned, and a continuation-in-part of Ser. No. 148,513, June 1, 1971. This application Jan. 24, 1974, Ser. No. 436,075
Int. Cl. G11b *7/08;* **H04n** *5/06, 5/30*
U.S. Cl. 178—7.2 **14 Claims**

1. A method of reproducing video information recorded in tandem array along a record track of a record member having a sequence of information containing frame recordings and a sequence of synchronizing indicia associated with said frame recordings respectively, comprising:

relatively moving said record member and a video pick-up means in a manner to carry said frame recordings successively through the scanning zone of said video pick-up means,

interrogating said frame recordings as they pass through said scanning zone and generating respective full-frame video picture signals on an output of said video pick-up, interrogating the synchronizing indicia associated with each frame recording as the frame recording approaches the scanning zone and developing frame vertical sync signals thereof at a frequency related to the rate of movement of the synchronizing indicia through the scanning zone,

passing said full-frame video picture signals and said vertical sync signals to a television receiver having a viewing screen, and

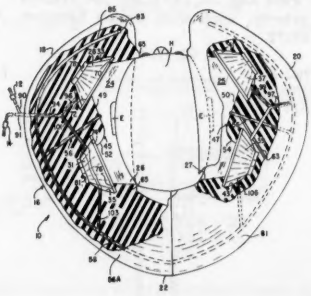


applying said frame vertical sync signals to control the generation of images defined by the respective frame recordings on said viewing screen by employing said frame vertical sync signals to condition the image writing means of said television receiver to write respective images on its screen.

3,900,707
SPEAKER APPARATUS

Brian A. Hanson, Woodridge, Ill., assignor to Hear-Muffs, Inc., Downers Grove, Ill.

Filed June 6, 1973, Ser. No. 367,521
Int. Cl.[2] H04M *1/05;* **H04R** *5/00*
U.S. Cl. 179—156 R **11 Claims**



1. Speaker apparatus adapted to be worn on the head of a user and adapted to be coupled to a sound reproducing system for causing sounds to be emitted from said apparatus, said speaker apparatus comprising:

a first and second pair of oppositely-disposed spaced-apart members for engaging the head of the user over the ears of the user, said members each having respective first and second chambers including respective first and second openings facing substantially toward one another for receiving the ears of the user, said ears occupying first and second central portions of the respective first and second openings;

means defining a first pair of spaced-apart front and rear cavities opening into said second chamber;

means defining a second pair of spaced-apart front and rear cavities opening into said second chamber;

a first pair of front and rear sound transmitting units mounted within said first pair of respective front and rear cavities and positioned with their front faces generally facing said first chamber;

a second pair of front and rear sound transmitting units mounted within said second pair of respective front and rear cavities and positioned with their front faces generally facing said second chamber;

conducting means adapted to couple each one of said sound transmitting units to the sound reproducing system;

means defining a pair of longer rear acoustic paths extending in acoustic communication between the respective mid portions of the front faces of said rear transmitting units and the respective mid points of the first and second chambers for guiding sound emanating from the rear units therealong to the ears of the user when positioned within said first and second openings; and

means defining a pair of shorter front acoustic paths extending in acoustic communication between the respective mid portions of the front faces of the respective front transmitting units and the respective mid points of the first and second central portions of the openings of said first and second chambers for guiding sound emanating from said front units therealong, to the ears of the user when positioned within said first and second openings, said longer rear acoustic paths being substantially greater in length than said shorter front acoustic paths to guide sound moving from said rear transmitting units energized by the system through greater distance to said first and said second openings than the distances through which sound moves from said front transmitting units energized by the system to said first and said second openings.

3,900,708

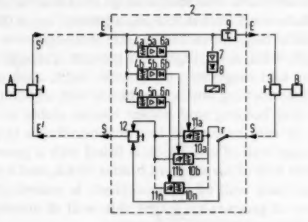
SELECTIVE ECHO SUPPRESSOR

Hermann Bendel, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation of Ser. No. 240,294, March 31, 1972. This application Apr. 5, 1973, Ser. No. 348,207

Int. Cl. H04b *3/20*

U.S. Cl. 179—170.2 **21 Claims**



1. An echo suppressor for a speaking circuit of a fourwire transmission system having a transmitting path and a receiving path, comprising: a set of first filters connected in said transmitting path; a plurality of continuously controllable regulating means each of which is connected to and associated with a respective first filter to control signal passage therethrough; a set of second filters connected to said receiving path, each of said second filters having a partial frequency range covering a separate portion of the total frequency range of said second filters, and each of said first filters having a partial frequency range corresponding to that of a separate second filter; a plurality of signal evaluation elements each of which is connected between a respective second filter and the regulating means associated with its corresponding first filter and operable to control signal passage through said corresponding first filter in accordance with the level of speech signals in said receiving path which are within the corresponding partial frequency range; means for establishing an operation threshold for said plurality of evaluation elements, whereby attenuation is controlled in the respective partial frequency ranges proportionally with respect to signal levels above said threshold at the outputs of the respective second filters; and a speech detector connected to and controlled from the receiving path and a transfer device connected to said transmitting path and connected to and controlled by said speech detector to bridge and bypass said first filters if no speech signal is present in the receiving path.

3,900,709

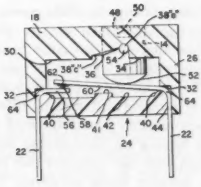
MULTIPLE SWITCH ASSEMBLY HAVING INDEPENDENT OPERATORS ROTATABLY CUMMING DISCRETE LEAF SPRING TYPE CONTACT ASSEMBLIES

Wilmer Lee Sheesley, Harrisburg, and William Vito Pauza, Palmyra, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 454,530, March 25, 1974, abandoned. This application Apr. 15, 1974, Ser. No. 460,843

Int. Cl.[2] H01H *21/12, 1/26*

U.S. Cl. 200—5 R **17 Claims**



1. A package containing one or more separate electrical switches, which comprises:

a. an insulating housing consisting of a base and a cover and having an interior space in which one or more switches are positioned, said cover having one or more distinct apertures extending into the interior space, each aperture being in alignment with a switch, said base having interior support means for supporting the one or more switches;

b. one or more electrical switch contact assemblies stamped and formed from a coplanar sheet of material, each switch contact assemblies having a fixed arm extending into the interior space from one side of the housing and a resilient movable arm extending obliquely upwardly into the interior space from another side of the housing with the free end thereof being spaced above the free end of the fixed arm, and further, legs integral with and extending from each arm depending from the respective sides of the housing for insertion into electrical circuit openings;

c. one or more actuating means movably positioned in the one or more apertures and in biasing contact with the one or more movable arms for removably moving the movable arm into contact with the fixed arm thereby permitting an electrical current which may be present in one arm to flow therefrom to the other arm; and

d. retaining means positioned on the one or more actuating means for retaining, in cooperation with the biasing contact of the one or more movable arms, the actuating means in the apertures.

3,900,710

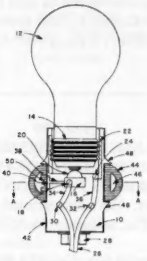
SQUEEZABLY ACTUATED GENERAL PURPOSE ELECTRIC SWITCH

John Potter, Star Rt. Box 47, Rt. 515, Vernon, N.J. 07462

Filed Oct. 1, 1973, Ser. No. 402,007

Int. Cl.[2] H01H *35/34*

U.S. Cl. 200—81 H **2 Claims**



1. A squeezably actuated general purpose electric switch comprising in combination:

a. a housing;

b. a push on-push off electrical switch mounted within said housing having an electrical input terminal for receiving a conductor of electrical power and an electrical output terminal for transmitting electrical power to an appliance;

c. an actuator for said push switch slideably mounted within said housing, said actuator having an end face communicating with the exterior of said housing; and

d. a flexible hollow squeezable switch member in the shape of a toroid surrounding said housing filled with a substantially non-compressible liquid secured to said housing, said member having an expandable surface portion in communication with said actuator end face, said expandable surface portion being relatively thinner than the remaining surface of said member.

3,900,711

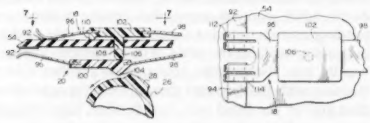
ELECTRICAL CONTACTOR ASSEMBLY FOR HIGH FREQUENCY APPLICATIONS

Kenneth C. Holland, Portland, Oreg., assignor to Tektronix Inc., Beaverton, Oreg.

Division of Ser. No. 361,362, May 17, 1973, abandoned, which is a division of Ser. No. 114,273, Feb. 10, 1971, Pat. No. 3,753,170. This application Feb. 4, 1974, Ser. No. 439,177

Int. Cl. H01h *1/00*

U.S. Cl. 200—238 **3 Claims**



1. An electrical contact member for engagement and disengagement with a fixed contact member, comprising:

a resilient mounting member for mounting the contact member on a mounting means and a free end;

a resilient contact member having one end defining a U shaped contact member for reducing inductance of said contact member and a free end; and

insulation means engaging both said free ends for insulatingly connecting said resilient mounting member and said resilient contact member and for reducing capacitance therebetween.

3,900,712

KEYBOARD SWITCH ARRANGEMENT

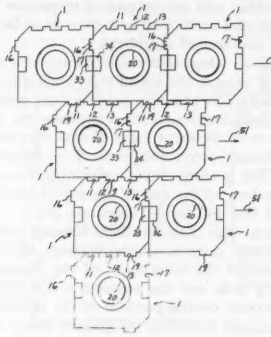
Satoshi Fukao, Kasugai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Jan. 18, 1974, Ser. No. 434,591

Claims priority, application Japan, Feb. 23, 1973, 48-22564

Int. Cl. H01h *13/04;* **B41j** *5/08*

U.S. Cl. 200—307 **8 Claims**



8. A keyboard switch arrangement comprising in combination:

a. a base plate having engaging holes therein;

b. a plurality of key switch units arranged side by side on said base plate, each including a key stem, a push button attached thereon, key stem holder block with four outer side walls, an upper and lowest portions fixed on said base plate, preventing said key stem from slipping out, including engaging projections provided at said lowest portion inserted into corresponding engaging holes formed in said base plate, said holder blocks having substantially a square shape in cross-section, and having at least one wall comprising thereon a plurality of vertically oriented grooves, and switch means located within said holder blocks operated by manipulative depressing said push button;

c. coupling means provided on said outer side walls of each of said holder blocks and comprising a plurality of grooves on a first side wall, a ridge on a second side wall opposite to said first side wall, a groove on a third side wall and a ridge on a fourth side wall opposite to said third side wall, said ridges and grooves extending vertically on said respective outer side walls, said coupling means interlocking one holder block with adjacent holder blocks and holding said holder blocks stably in various modes on said base plate in a manner that a ridge on a fourth side wall of one block is fitted with a groove on a third side wall of an adjacent holder block, and a ridge on a second side wall of the one block is selectively fitted with one of grooves on a first side wall of another adjacent holder block.

3,900,713

THERMAL LIMITER CONSTRUCTION AND ELECTRICAL SWITCH AND SYSTEM UTILIZING THE SAME

Emil Robert Plasko, Dayton, Ohio, assignor to Micro Devices Corporation, Dayton, Ohio

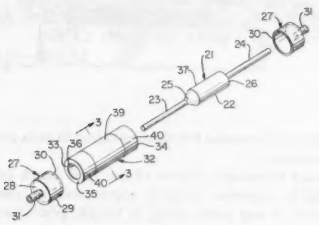
Division of Ser. No. 344,745, March 26, 1973, Pat. No. 3,829,809. This application June 4, 1974, Ser. No. 476,313

Int. Cl. H05b *9/06*

U.S. Cl. 219—10.55 D **6 Claims**

1. In an electrical control system for a micro-wave oven that has a pair of power source lead means leading from a power source to the energy generating means for the oven, the im-

provement comprising an oven door operated electrical switch in one of said power source lead means that is normally closed only when said door is in a closed position thereof and is normally open only when said door is in an open position thereof, a thermally responsive device in one of said power source lead means for opening its respective power source lead means when said device is sensing a certain temperature condition, and means for creating said certain temperature condition when said switch abnormally remains closed and said oven door is opened to terminate the operation of said energy generating means, said means for creating said certain temperature condition comprising a branch lead means for electrically interconnecting said two power source lead means together, said branch lead means interconnecting to the power



source lead means that has said switch therein at a point intermediate said switch and said energy generating means, said branch lead means having an electrically operated heater means disposed therein adjacent said device for creating said certain temperature condition sensed by said device when current flows through said branch lead means, and another electrical switch means disposed in said branch lead means, said other electrical switch means normally being open only when said door is in a closed position thereof and being normally closed only when said door is in an open condition thereof whereby said heater means is only energized if the first named switch is abnormally closed and said door is in an open condition thereof, said other switch means carrying said device and said heater means, said heater means and said device being readily replaceable together as a single unit.

3,900,714

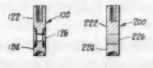
HEATED TOOL FOR HEADING PLASTIC STUDS

Lewis R. Beyer, 1020 Brookpark Rd., Cleveland, Ohio 44109

Filed Oct. 17, 1973, Ser. No. 407,073

Int. Cl. H05b *1/00;* **B23k** *3/02;* **B32b** *31/00*

U.S. Cl. 219—229 **6 Claims**



1. A tool for heading a plastic stud against a heat-conductive element, comprising a heater, heat-conductive forming means including a concave head-forming surface for heating and forming an end of a plastic stud, and a thermally conductive heat conduit connecting said forming means to said heater, said forming means further including surface portion means for contacting a heat-conductive element against which the plastic stud is formed, and said heat conduit including a portion closely adjacent said forming means more restrictive to heat transmission than the forming means, said portion being capable of transmitting heat to said forming means faster than the forming means radiates heat away to ambient atmosphere but slower than the heat conductive element and stud conduct away heat from said forming means.

3,900,715

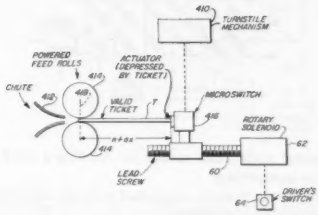
TICKET ISSUING AND COLLECTION SYSTEMS

Alec Patrick James, Sutton Coldfield, England, assignor to National Research Development Corporation, London, England

Division of Ser. No. 00,014, Jan. 2, 1970, abandoned. This application Mar. 21, 1972, Ser. No. 236,583

Int. Cl.[2] G06K *5/00;* **G07F** *7/00*

U.S. Cl. 235—61.7 R **8 Claims**



1. A transport vehicle ticket system designed to collect the exact fare from each passenger boarding a transport vehicle traveling over a multiple time- or spatial-interval route wherein the fare due to be paid by each passenger upon boarding is directly related to the number of intervals to be traveled by that passenger, regardless of whether the passenger is traveling to the end of the line, or is disembarking sooner, said ticket system including:

1. ticket issuing apparatus including:

means for collecting the particular fare tendered by each passenger;

means for determining the amount so tendered; and means for issuing a ticket, to each such passenger, having applied thereon by said issuing means a significant portion of a length $n + (a+b)x$, wherein:

n is a constant length greater than or equal to zero, provided to be greater than zero when needed to permit the significant portion to be long enough for the ticket to be properly handled;

x is a constant increment of length, greater than zero, chosen to represent an individual interval of travel,

a corresponds to the number of intervals the vehicle has traveled along said route prior to the boarding of each particular passenger; and

b corresponds to the number of intervals that passenger wishes to travel between boarding and disembarking from the vehicle; and

2. ticket receiving apparatus, including:

means for tentatively accepting each ticket tendered by each disembarking passenger;

means associated with said tentatively accepting means for registering the lapsing of each of said intervals, as the vehicle travels from one end of the route to the other and for detecting the length of said significant portion of each ticket so tendered, the detecting means including means for discriminating between a ticket for which said length is less than, and, instead, is at least equal to that length which would have been provided on the ticket had the disembarking passenger indeed paid the exact fare for the number of intervals actually traveled.

3,900,716
OPTICAL STATIC CARD READER

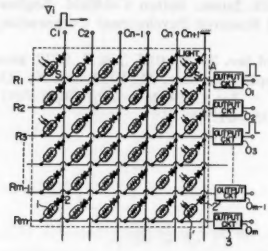
Hidetsugu Kawabata, Hirakata; Toshio Yamashita, Katano; Hiroshi Uda, Kashiwara; Manabu Yoshida, and Saburo Kitamura, both of Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 12, 1973, Ser. No. 406,038

Claims priority, application Japan, Oct. 17, 1972, 47-104270; Oct. 17, 1972, 47-104271; July 23, 1973, 48-82952

Int. Cl. G06k 7/14; H01j 39/12

U.S. Cl. 235—61.11 E 10 Claims



4. An optical static card reader for reading a card having holes therein comprising:

a plurality of electrically separated column electrodes extending in a first direction,

a plurality of electrically separated row electrodes extending in a second direction,

a plurality of reference light sensor and blocking diode pairs, each of said reference light sensors being connected in series with a corresponding blocking diode, one end of each of said reference light sensor and blocking diode pairs being connected to the same column electrode, the other ends of said reference light sensor and blocking diode pairs being connected to corresponding row electrodes,

a plurality of reading light sensor and blocking diode pairs, each of said reading light sensors being connected in series with a corresponding blocking diode, a reading light sensor and blocking diode pair being connected between each of said row electrodes and each of said column electrodes not connected to a reference light sensor and blocking diode pair, the blocking diodes connected to said reference light sensors being connected to conduct current in a first direction with respect to said column and row electrodes and the blocking diodes connected to said recording light sensors being connected to conduct current in the opposite direction, the resistances of said reference and reading light sensors having similar variations,

a plurality of column terminals connected to corresponding column electrodes for sequentially receiving recording electrical signals,

a plurality of row terminals connected to corresponding row electrodes, a readout signal being produce at a row terminal in accordance with the relative values of the resistance of the reading sensor supplied with said reading signal and the resistance of the reference sensor of the corresponding row,

means for maintaining the column electrode to which said reference light sensor and blocking diode pair are connected at a predetermined bias potential, and

output interface circuit means connected to said row terminals, said interface circuit means being rendered operative by said readout signal, said reading light sensors being arranged to correspond to the possible positions of apertures in said card to be read by said card reader.

3,900,717
APPARATUS FOR SCANNING RAISED INDICIA

Chin Tao Wu, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 18, 1973, Ser. No. 425,935

Int. Cl. G06k 7/04

U.S. Cl. 235—61.11 C 7 Claims

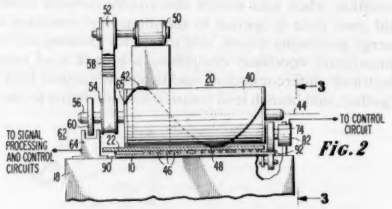


Fig. 2

1. Scanning apparatus for reading raised indicia comprising, in combination:

elongated transducer means of the type which produces a signal in response to being compressed at least a given amount at any point along its length, positioned along a line to be read of said raised indicia; and

means adapted to serially depress points along the length of said transducer means, said depression being of an amount such that said transducer means is compressed at least said given amount only at points where said raised indicia is located, whereby said signals produced by said transducer means will be indicative of said raised indicia.

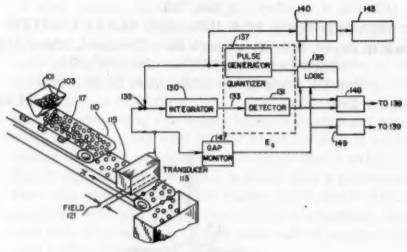
3,900,718
SYSTEM FOR COUNTING PILLS AND THE LIKE

Harold H. Seward, 16 Frost St., Arlington, Mass. 02174

Filed Dec. 26, 1973, Ser. No. 427,789

Int. Cl.[2] G06M 7/02; G06G 7/18

U.S. Cl. 235—150.51 13 Claims



1. Apparatus for counting parts presented in groups separated by gaps, said parts generally characterized by contributing substantially equally to the integral of a transducer's response thereto, said apparatus comprising:

transducing means for detecting said parts and having a response,

first means for forming an integral, connected to said transducing means to operate said response,

second means for dividing said formed integral by a number of equal fractional measures, including means for varying said measures such that on the average an integral number n of said measures are required to form a quotient of one with a single parts's contribution to said formed integral, the integer *n* being selected to be even,

third means for counting said measures and accumulating both the number of odd multiples of half said integer ($n/2$) and a fractional remainder,

fourth means for detecting said gaps, said fourth means having an output signal; and

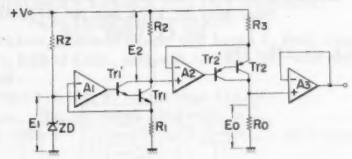
fifth means responsive to said fourth means for clearing said third means of said remainder upon the detection of a gap and after said measures have been counted by said third means.

3,900,719

HYBRID ARITHMETIC DEVICE

Satoshi Yamauchi, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1973, Ser. No. 355,061
Claims priority, application Japan, May 1, 1972, 47-43497
Int. Cl. G06j *1/00;* **G06g** *7/16*
U.S. Cl. 235—150.52 **5 Claims**



1. A hybrid arithmetic, device comprising:

a first stage including a first resistor, a Zener diode connected to said first resistor, a first transistor amplifier having an output and an input, second and third resistors connected to the output of said first transistor amplifier, a first operational amplifier having a plurality of inputs and an output, the output thereof being connected to the input of said first transistor amplifier, one of said inputs of said first operational amplifier being connected to the point of interconnection between said Zener diode and said first resistor, the other input of said first operational amplifier being connected to a feedback path from the output of said first transistor amplifier;

a second stage including a second transistor amplifier having an input and an output, fourth and fifth resistors connected to the output of said second transistor amplifier, a second operational amplifier having a plurality of inputs and an output, the output of said second operational amplifier being connected to the input of said second transistor amplifier, one of the inputs of said second operational amplifier being connected to the output of said first transistor amplifier and the other input thereof being connected to a feedback path from the output of said second transistor amplifier;

means for setting the values of at least a selected pair of said resistors to selected digital values representing the values of arithmetic operands so as to derive across the fifth resistor an output voltage whose value is a measure of the result of a selected arithmetic operation on said operands.

3,900,720

METHOD AND APPARATUS FOR APPLYING AN INSTALLATION DIMENSION TO A BEVEL GEAR

Erhard Konersmann, Zurich, and Rudolf Gruber, Bichelsee, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed July 1, 1974, Ser. No. 484,776
Int. Cl.² G01M *13/02*
U.S. Cl. 235—151.32 **3 Claims**

1. An apparatus for applying an installation dimension at a bevel gear having a shoulder and a front surface, comprising:

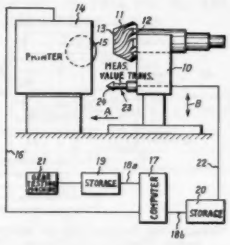
a. a bevel gear testing machine for determining the shoulder dimension of the bevel gear;

b. a storage for storing the determined shoulder dimension, said storage being operatively connected with the bevel gear testing machine;

c. a measuring device for determining the distance between the shoulder and the front surface of the bevel gear and which distance constitutes the addendum dimension of the bevel gear;

d. said measuring device incorporating a measurement value transmitter and a feeler for measuring said addendum dimension;

e. a further storage for storing said addendum dimension of the bevel gear operatively connected with the measurement value transmitter of said measuring device;



f. a marking device for applying data to the bevel gear, said marking device comprising a printer mechanism containing a rotatably mounted number wheel for each numerical value which is to be applied at the front surface of the bevel gear;

g. said marking device further including a support at which there is located said bevel gear and said feeler of said measuring device;

h. a computer for the addition of both the stored shoulder dimension and the addendum dimension into a block dimension;

i. said computer being operatively connected with said two storage devices and with the marking device for transmitting the block dimension from the computer to the marking device.

3,900,721

SERIAL-ACCESS LINEAR TRANSFORM

Jeffrey M. Speiser, and Harper John Whitehouse, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 14, 1974, Ser. No. 442,530
Int. Cl. G06f *15/34*
U.S. Cl. 235—156 **6 Claims**

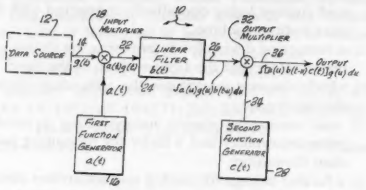
1. A serial-access linear transform apparatus, suitable for signal processing systems requiring the rapid generation of linear transforms of a spatial or temporal signal, where the transform is in sampled form consisting of a series of N-sample terms, and where the signal consists of a series of N-sample pulses, comprising:

a data source, for providing the signal which is to be processed into a linear transform, the output of the data source being the function $g(t)$;

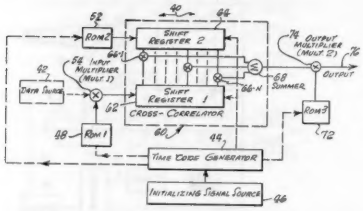
a first function generator, which generates a function $a(t)$; an input multiplier, whose two inputs are the outputs, $g(t)$ and $a(t)$, of the data source and the first function generator, for multiplying the two inputs, the output of the multiplier being $a(t)g(t)$;

a linear filter having an impulse response $b(t)$, whose input is the output signal, $a(t)g(t)$, of the input multiplier and whose output is the signal $a(u)g(u)\ b(-u)\ du$;

a second function generator, which generates the function $c(t)$;



SERIAL-ACCESS APPARATUS FOR THE GENERATION OF A LINEAR TRANSFORM (FILTER FORM)



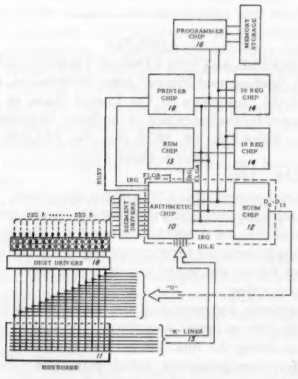
SERIAL-ACCESS APPARATUS FOR THE GENERATION OF A LINEAR TRANSFORM (CORRELATOR FORM)

an output multiplier, whose inputs are the outputs of the linear filter and of the second function generator, and whose output is the desired sequence of terms of the linear transform, namely $a(u)b(t-u)c(t)\ g(u)\ du$.

3,900,722
MULTI-CHIP CALCULATOR SYSTEM HAVING CYCLE AND SUBCYCLE TIMING GENERATORS

Michael J. Cochran, Richardson, and Charles P. Grant, Jr., Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 13, 1973, Ser. No. 397,060
Int. Cl.[2] G06F 1/04
U.S. Cl. 235—152 **13 Claims**



1. In a portable electronic calculator system implemented on at least two semiconductor chips, the combination comprising:

a. a first cycle timing generator and a first subcycle timing generator on one of said semiconductor chips for generating cycle times and subcycle times thereon;

b. a second cycle timing generator and a second subcycle timing generator on the other of said semiconductor chips for respectively generating cycle times and subcycle times thereon;

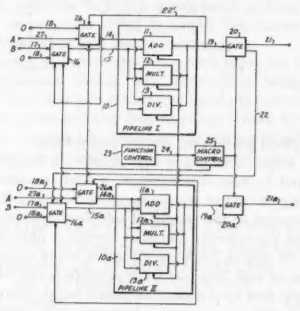
c. means on said one chip for generating the condition signal upon the occurrence of an internal timing condition on said one chip, said occurrence synchronized with said cycle times and subcycle times generated by said first cycle and subcycle generators; and

d. means on said other chip responsive to said condition signal for synchronizing said second cycle and subcycle timing generators with said first cycle and subcycle generators.

3,900,723
APPARATUS FOR CONTROLLING COMPUTER PIPELINES FOR ARITHMETIC OPERATIONS ON VECTORS

Lewis R. Bethany, St. Paul; Daniel J. Desmonds, Roseville, and Donald P. Tate, St. Paul, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed May 28, 1974, Ser. No. 473,652
Int. Cl.[2] G06F 7/38
U.S. Cl. 235—156 **4 Claims**



1. Apparatus for controlling first and second arithmetic pipelines in a computer, wherein said first pipeline includes first and second inputs and a first output and first arithmetic means connected between said first and second inputs and said first output, and wherein said second pipeline includes third and fourth inputs and a second output and second arithmetic means connected between said third and fourth inputs and said second output, each of said first and second arithmetic means accomplishing arithmetic operations on operands appearing at respective ones of said first, second, third and fourth inputs to derive respective resultants, said operands being arranged in a plurality of continuous streams, each stream forming a respective operand vector, said apparatus comprising:

first gate means connected to said first input and having fifth, sixth and seventh inputs for selectively processing data appearing at a selected one of said fifth, sixth and seventh inputs to said first input;

second gate means connected to said second input and having eighth, ninth and tenth inputs for selectively processing data appearing at a selected one of said eighth, ninth and tenth inputs to said second input;

third gate means connected to said third input and having eleventh, twelfth and thirteenth inputs for selectively processing data appearing at a selected one of said eleventh, twelfth and thirteenth inputs to said third input;

fourth gate means connected to said fourth input and having fourteenth, fiftennth, sixteenth and seventeenth inputs for selectively processing data appearing at a selected one of said fourteenth, fifteenth, sixteenth and seventeenth inputs to said fourth input;

means connecting said fifth, eighth and seventeenth inputs to said first output to receive data from said first pipeline;

means connecting said sixth and twelfth inputs to a source of one of said operand vectors;

means connecting said seventh, tenth, thirteenth and sixteenth inputs to a source of data representative of a zero value;

means connecting said ninth and fifteenth inputs to a source of a second of said operand vectors;

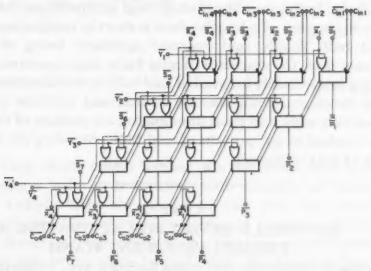
means connecting said eleventh and fourteenth inputs to said second output to receive data from said second pipeline; and

control means for selectively operating said first, second, third and fourth gate means to selectively process data and operands appearing at selected inputs of said first, second, third and fourth gate means to respective first, second, third and fourth inputs of said respective first and second pipelines.

3,900,724
ASYNCHRONOUS BINARY MULTIPLIER USING NON-THRESHOLD LOGIC

George W. McIver, Redondo Beach, and James L. Buie, Panorama City, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Feb. 11, 1974, Ser. No. 441,099
Int. Cl. G06f *7/50, 7/52*
U.S. Cl. 235—164 **15 Claims**



1. A multiplier using a sequential-add algorithm to multiply together two binary numbers, said multiplier comprising:

a. a first set of signal lines extending in one direction for carrying signals representing the bits of a first number;

b. a second set of signal lines extending across said first set for carrying signals representing the bits of a second number, said first and second set of signal lines intersecting to form a matrix, with a single pair of intersecting signal lines forming a single matrix position; and

c. logic circuit means for generating the appropriate cross product for each one of said matrix positions and adding that cross product to the appropriately weighted cross products generated at other ones of said matrix positions; the circuitry at each one of said matrix positions comprising

1. means including not more than six input lines for receiving from the circuitry at other matrix positions of said multiplier complementary binary signals representing sum or carry inputs;

2. means including not more than two lines for receiving external binary signals representing one bit of each of the numbers to be multiplied together;

3. a first plurality of logic circuits for forming the appropriate complementary binary signals representing cross products between the external signals;

4. a second plurality of non-threshold logic gates connected to receive the complementary binary signals from said first plurality of logic circuits and connected with said input lines to form not more than eight AND gates;

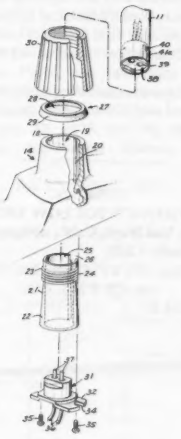
5. a third plurality of non-threshold logic gates connected to the outputs of said AND gates to form four OR gates; and

6. means including not more than four output lines connected to the outputs of said OR gates for transmitting to succeeding stages of said multiplier complementary binary signals representing sum and carry outputs respectively.

3,900,725
NAVIGATION LIGHT FOR BOATS

John F. Komon, Windsor, Canada, assignor to Aqua-Marine Manufacturing Limited, Toronto, Canada

Continuation of Ser. No. 178,324, Sept. 7, 1971, abandoned. This application Feb. 25, 1974, Ser. No. 445,216
Int. Cl. B63b *45/04*
U.S. Cl. 240—7.5 **4 Claims**



1. A navigation light for boats comprising

a post,

illuminating means carried by said post,

a mounting bracket adapted to be mounted on a boat and having an opening of tapered cross-section defined by tapered side walls extending therethrough,

said mounting bracket having an upstanding neck through which the opening in said bracket extends,

a bushing mounted in the opening in said bracket and slidable therein to a limited extent in one direction parallel to the longitudinal axis of the opening in said bracket,

said bushing having an outer surface,

a part of said outer surface being tapered to conform generally to said tapered side walls and engaging said tapered side walls,

said bushing having a threaded neck,

said threaded neck projecting beyond said neck pf saod bracket,

said bushing also having an opening of cross-section complementary to the cross-section of said post, and said opening extending through said bushing and through said threaded neck thereof in the same general direction as the opening in said bracket,

said post being mounted in the opening in said bushing,

said bushing having a slot therein extending from said outer surface into the opening in said bushing and extending from one end of said bushing to the other end thereof,

and a cap member having an opening therethrough which said post extends,

said cap member being threadably engageable with said threaded neck of said bushing and adapted to draw said part of said outer surface of said bushing into tight engagement with said tapered side walls defining the opening in said bracket by moving said bushing in said one direction, whereby the width of at least a part of said slot is decreased and said bushing is drawn into tight gripping engagement with said post,

said cap member having a skirt portion extending over said neck of said bracket and spaced apart from said neck of said bracket,

a first electrical element,

said first electrical element being positioned in the lower end of said post comprising openings therein and spaced contacts in said openings,

a second electrical element having spaced prongs,

means for mounting and circumferentially locating said second electrical element on said bracket with said second electrical element substantially closing the lower end of said opening in said bushing and with said prongs extending upwardly into the opening in said bushing,

the prongs on said second electrical element extending into said openings in said first electrical elements to provide an electrical connection therebetween when said post is supported on said base,

and electric lead means extending between said first electrical element and said illuminating means for completing a circuit thereto.

3,900,726

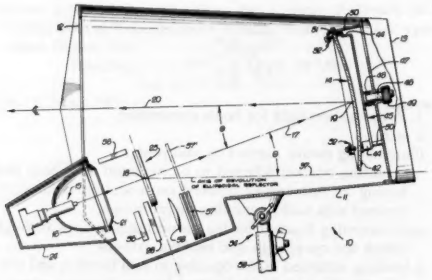
COMPACT FOLLOW SPOT

Clyde L. Tichenor, Van Nuys, Calif., assignor to Berkey-Colortran, Inc., Burbank, Calif.

Filed Apr. 25, 1974, Ser. No. 464,133

Int. Cl. F21v *7/00*

U.S. Cl. 240—41.35 R **16 Claims**



1. A compact follow spotlight comprising:

a housing having one end that is optically transparent,

an elliptic mirror mounted within said housing near the other end thereof, the reflecting surface of said mirror comprising a section of an ellipsoid of revolution, said section being offset to one side of a meridian plane including the axis of revolution of said ellipsoid, and

a light source mounted within said housing near said one end remote from the near focus of said ellipsoid of revolution and offset to one side thereof so as to be substantially out of the path of light reflected from said mirror, said light source being arranged to project light past an object to be imaged placed at the near focus of said ellipsoid of revolution and toward said mirror, light from said source being reflected by said mirror through said transparent end and focused by said elliptic mirror in a distant focal plane coinciding with the far focus of said ellipsoid of revolution.

3,900,727

LAMP WITH TUBULAR BULB AND REFLECTOR

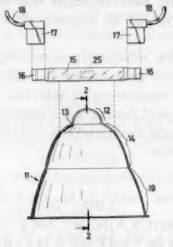
Hugo Hutz, Steinstrasse 1, 8032 Grafelfing, Germany

Continuation of Ser. No. 358,104, May 7, 1973, abandoned. This application Sept. 17, 1974, Ser. No. 506,697

Claims priority, application Germany, May 8, 1972, 2222529; Feb. 17, 1973, 2308003

Int. Cl. F21r *7/00*

U.S. Cl. 240—41.35 R **16 Claims**



1. An electric lamp which produces a rotationally symmetric light beam with a very high illuminating efficiency, comprising a reflector having two diametrically opposed apertures, said reflector being rotationally symmetric about an axis parallel to the light beam of the lamp and a tubular-shaped discharge bulb extending through said apertures and having an illuminating arc of a length which is short in comparison to the total bulb length, said opposed apertures being of a size greater than the diameter of said bulb, said apertures terminating immediately forward of said bulb in the direction of the light beam and being located so that said reflector encloses essentially only said short illuminating arc portion of the bulb, the residual major portion of said bulb extending on the outside of said reflector.

3,900,728

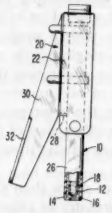
HAND HELD DEVICE FOR ACTIVATING A CHEMILUMINESCENT WAND

Gordon B. Holcombe, 603 Santa Barbara Ave., Millbrae, Calif. 94030

Continuation-in-part of Ser. No. 350,946, April 13, 1973, Pat. No. 3,829,678. This application July 22, 1974, Ser. No. 490,892

Int. Cl. F21v *21/00*

U.S. Cl. 240—52 R **7 Claims**



1. Apparatus for activating a chemiluminescent wand having a first chemical in an inner frangible tube and a second chemical in an outer flexible casing encompassing the inner tube, the apparatus comprising:

a bracket for restraining one end of the wand, and allowing the other end of the wand to extend free from the bracket, the bracket including a fulcrum portion which bears against the wand intermediate its opposite ends, and

a lever arm rigidly connected to the bracket and extending toward the free end of the wand, the lever arm, the fulcrum portion and the free end of the wand all residing in the same plane, whereby a user of the apparatus activates the wand by squeezing together the free end of the wand and the lever arm thereby bending and fracturing the inner frangible tube of the wand over the fulcrum portion and generating chemiluminescence.

3,900,729

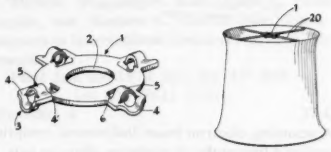
LAMP SHADE CENTER

Peter S. Smith, Nabnasset, and Richard B. Theurer, Burlington, both of Mass., assignors to Massachusetts Machine Shop Inc., Boston, Mass.

Filed Mar. 11, 1974, Ser. No. 449,779

Int. Cl. F21v *17/00*

U.S. Cl. 240—136 **3 Claims**



1. A lamp shade center formed of a flat metal stock stamping having a hole in its middle and a plurality of retainers spaced radially from the center of said hole for receiving radial lamp shade support wires, each said retainer comprising at least three wire supporting lanced sections spaced readially along an axis in the plane of said stock, the first and third of which are deformed in one direction normal to said plane of said stock, and the intervening section deformed in the opposite direction from said plane of said stock, said lanced sections being connected to one another at their ends and severed from one another at their middle portions, said lanced sections defining together a radially extending tunnel-like opening terminating at a positive inner stop defined by the edge of said metal stock from which the innermost said section was separated during lancing, said retainers adapted for securing said wires by being simultaneously deformed by a press, thereby to grip and retain said wires.

3,900,730

DEVICE FOR PHOTOELECTRICALLY MONITORING DYNAMIC PROCESSES

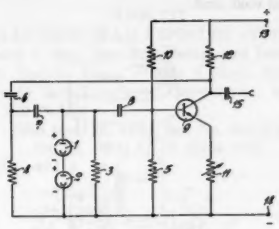
Walter Gith, Monchengladbach, Germany, assignor to Schlafhorst & Co., Monchengladbach, Germany

Continuation of Ser. No. 124,177, March 15, 1971, abandoned. This application Oct. 9, 1973, Ser. No. 404,760

Int. Cl. H01j *39/12*

U.S. Cl. 250—206 **6 Claims**

1. A device for carrying out a method of photoelectrically monitoring dynamic processes, comprising a silicon photoelectric element, an ohmic resistance connected directly in parallel with said photoelectric element and having a resistivity such that said photoelectric element with respect to a direct current component therein caused by a substantially non-deviating light source is substantially short-circuited thereby, a bandpass connected across said photoelement, said ohmic resistance comprising a part of said bandpass, said bandpass including means for providing an in phase supplementary AC potential across said photoelement, whereby said



bandpass comprises an RC generator operating below the amplitude limit of its oscillatory potential.

3,900,731

METHOD AND APPARATUS FOR STABILIZING THE GAIN OF A PHOTOMULTIPLIER

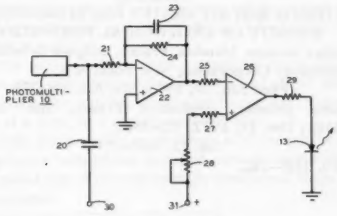
Philippe Chevalier, Paris, and Bronislav Seeman, Meudon, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Jan. 22, 1973, Ser. No. 326,197

Claims priority, application France, Jan. 24, 1972, 72.02181

Int. Cl.² H01J *39/12*

U.S. Cl. 250—207 **11 Claims**



8. A system for stabilizing the gain of a photomultiplier having at least an anode and a photocathode comprising, a light source of variable intensity operative to illuminate said photocathode, means for providing a source of reference current to a selected value, means for determining the mean or average anode current of the photomultiplier, and means coupled to said light source and said anode current determining means for comparing the mean or average anode current of said photomultiplier and said selected value of reference current and operative continuously to generate a control signal representative of the difference between said mean or average anode current and said selected value of reference current for varying the intensity of illumination of said light source in response to the changes in the value of said difference to stabilize said photomultiplier gain.

3,900,732

ENCODER DISC MOUNT AND ALIGNING TOOL

John E. Costales, Canoga Park, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 15, 1974, Ser. No. 460,871

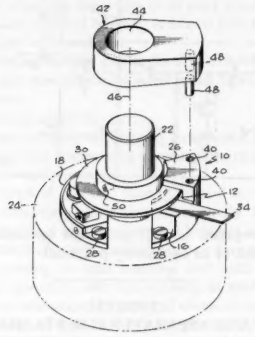
Int. Cl.² G01D *5/36;* **B25B** *27/14*

U.S. Cl. 250—231 SE **4 Claims**

1. An encoder assembly in combination with an alignment tool for aligning an encoder detecting assembly with a rotatable encoder plate having a rotating shaft, comprising:

a. a removable tool including a void adapted to fit about said shaft;

b. at least two prongs depending from said tool and spaced from said void; and



c. said encoder detecting assembly including at least two discrete receiving means capable of simultaneously receiving said at least two prongs when said void is fitted about said shaft,

whereby said encoder detecting assembly is capable of being fixed relative to said rotatable encoder plate at a resolution of 500 cycles per revolution of said encoder plate.

3,900,733

METHODS AND APPARATUS FOR MEASURING THE DENSITY OF GEOLOGICAL FORMATIONS

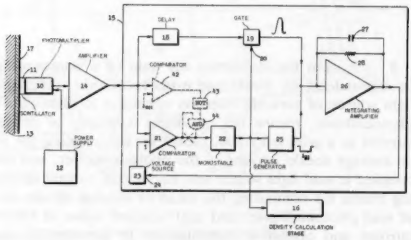
Bronislav Seeman, Meudon, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jan. 24, 1973, Ser. No. 326,379

Claims priority, application France, Jan. 24, 1972, 72.02181; Dec. 11, 1972, 72.43983

Int. Cl. G01v *5/00*

U.S. Cl. 250—262 **26 Claims**



1. A method of correcting borehole barite effects on gamma radiation detected from a formation of interest to determine a formation characteristic free of barite distortion comprising the steps of:

deriving a plurality of spectra of detected gamma radiation energies that are representative of detected formation gamma radiation and exceed a threshold energy value; and

comparing the spectra with one another to produce an output signal representative of a predetermined relationship therebetween to enable determination from the output signal of an adjusted threshold energy value corresponding to a minimum energy level for a formation characteristic determining spectra that results in the correction of borehole barite effects on the spectra of detected gamma radiation.

3,900,734

SCANNING ELECTRON-BEAM INSTRUMENT

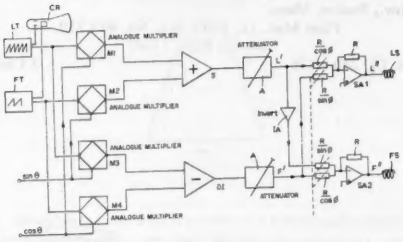
David Kynaston; Peter Irving Tillett, and Richard Stephen Paden, all of Cambridge, England, assignors to Cambridge Scientific Instruments Limited, Cambridge, England

Filed Apr. 18, 1974, Ser. No. 462,295

Claims priority, application United Kingdom, Apr. 19, 1973, 19142/73

Int. Cl. H01j *37/26*

U.S. Cl. 250—311 **2 Claims**



1. A scanning electron beam instrument comprising means for forming a fine probe of electrons along an axis, a variable-focus electromagnetic final lens acting on said probe, line and frame time base generators capable of generating line and frame scanning signals, line and frame scanning coils disposed to act on said probe ahead of said final lens whereby to cause the formation of a raster on a specimen placed at the focus of said final lens, variable control means controlling the focal length of said final lens, signal mixing means connected to said frame and time base generators and operative to mix said signals and feed derived line and frame scanning signals to said line and frame scanning coils respectively, said derived signals being such as to rotate said raster about said axis as compared with a raster produced by said first-mentioned signals, an interconnection between said signal-mixing means and said variable control means such as to vary the rotation of said raster by said signal-mixing means in opposition to rotation of said raster introduced by said final lens, whereby the orientation of said raster at the focus is independent of the focal length of said final lens at least over a range of focal lengths, and relative attenuating means interposed between at least one of said time base generators and said signal mixing means, capable of varying the dimension of said raster at the focus in a given direction transverse to said axis.

3,900,735

CORONA DISCHARGE APPARATUS

Helmut Jahn, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 287,330, Sept. 8, 1972, abandoned. This application Mar. 27, 1974, Ser. No. 455,485

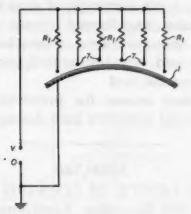
Claims priority, application Germany, Sept. 10, 1971, 2145268

Int. Cl. G03g *15/00*

U.S. Cl. 250—324 **20 Claims**

1. A corona-discharge apparatus for applying a substantially uniform electrostatic charge to a grounded photoconductive surface, comprising frame means, a plurality of at least three thin corona discharge wires clamped in said frame means and disposed above and substantially parallel to said photoconductive surface, and a plurality of resistors, each resistor being connected at one end to one single high voltage and at the

other end to a group of said wires, wherein said discharge wires are in sufficiently close proximity to one another to



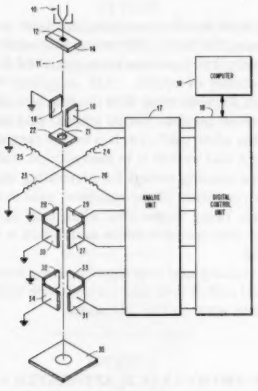
provide a substantially uniform electrostatic discharge over said photoconductive surface.

3,900,736

METHOD AND APPARATUS FOR POSITIONING A BEAM OF CHARGED PARTICLES

Michel S. Michail, Wappingers Falls; Ollie C. Woodard, Poughkeepsie, and Hannon S. Yourke, New York, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 28, 1974, Ser. No. 437,585
Int. Cl.[2] H01J *37/00*
U.S. Cl. 250—492 A 27 Claims



1. A method of positioning a beam of charged particles comprising:

ascertaining the actual location and shape of a four-sided area of a target in which the beam is to be applied relative to the location and shape of a design four-sided area;

directing the beam over the target after ascertaining the actual location of the area of the target and its shape relative to the location and shape of the design area;

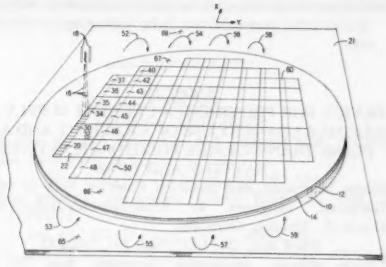
and moving the beam in a predetermined path ot each of a plurality of predetermined positions within the design area in accordance with a predetermined pattern while dynamically electronically compensating at each of the predetermined positions for the deviation of the actual position within the actual area from the predetermined position due to the actual area having a different location and shape relative to the location and shape of the design area to cause the beam to be shifted from the predetermined position and applied at the deviated actual position so that a pattern is written within the actual area in accordance with the predetermined pattern.

3,900,737

ELECTRON BEAM EXPOSURE SYSTEM

Robert Jacob Collier, New Providence, and Donald Richard Herriott, Morris Twp., Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 18, 1974, Ser. No. 461,876
Int. Cl. H01j *37/26;* B23k *9/00*
U.S. Cl. 250—492 A 13 Claims



1. An exposure system for selectively irradiating each of multiple subregions of a radiation-sensitive resist layer, each of said subregions including plural abutting stripe areas, correspondingly-positioned stripe areas in said respective subregions constituting a set of such areas, a single pattern being respectively associated with each different set of stripe areas, said system comprising

means for sequentially scanning a radiant beam over the plural sets of correspondingly-positioned stripe areas in said respective subregions in a set-by-set way, one stripe area at a time, in a two-dimensional way,

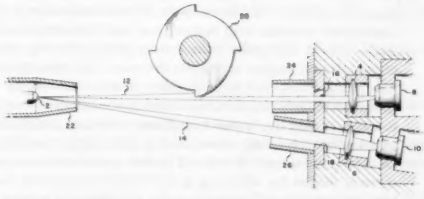
and means for intensity modulating said radiant beam in accordance with plural specified patterns as the respective plural sets of correspondingly-positioned stripe areas are scanned.

3,900,738

NON-CONTACT MEASURING GAUGE

Russell M. McKay, Sr., Los Altos, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed May 23, 1973, Ser. No. 363,185
Int. Cl.[2] G01N *21/30*
U.S. Cl. 250—560 6 Claims



1. In a non-contact measuring gauge the improvement comprising:

a base comprising an elongated flat member,

means for producing a non-coherent light rigidly affixed to said base,

a detector housing rigidly affixed to said base,

said detector housing including a face plate defining a first aperture and a second aperture,

a first detector mounted within said detector housing aligned with said first aperture,

a second detector mounted within said detector housing aligned with said second aperture,

a first lens system and a second lens system coaxially mounted between said means for producing non-coherent light and said first detector and said second detector respectively for focusing said non-coherent light on said detectors,

said first and second detector positioned equal radial distance from said non-coherent light means and aligned to simultaneously receiving radiation from said non-coherent light means, whereby

said detectors generate an output in response to and proportional to the non-coherent light impinging on said detectors.

3,900,739

DEVICE FOR PROVIDING A CURRENT SUPPLY TO INDUCTIVE LOADS BY USE OF A BATTERY AND A D. C. PULSE TRANSFORMER POSITIONED BETWEEN BATTERY AND LOAD

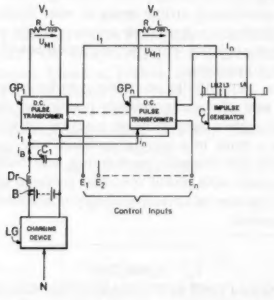
Wilhelm Morawski, and Heinrich Raeithel, both of Munich, Germany, assignors to Messerschmitt-Bolkow-Blohm G.m.b.H., Munich, Germany

Filed Aug. 28, 1973, Ser. No. 392,229

Claims priority, application Germany, Aug. 29, 1972, 2242353

Int. Cl. B60m *3/06;* **H02j** *7/00*

U.S. Cl. 307—41 **9 Claims**



1. A device for controlling the current supply to a plurality of inductive loads, comprising:

a battery;

a plurality of normally open d.c. pulse transformer means equal in number to the number of said inductive loads connected between said battery and said inductive loads, each of said d.c. pulse transformer means having input terminals and output terminals thereon, said input terminals being connected to each other and to said battery so that said battery supplies an amount of electrical energy to each of said d.c. pulse transformer means, said inductive loads each being connected to said output terminals on a respective one of said d.c. pulse transformer means;

control means for effecting a controlled sequential closing and opening of said d.c. pulse transformer means to effect a momentary connection of said battery to one of said inductive loads, at least one of said inductive loads being energized through a closed one of said d.c. pulse transformer means to thereby momentarily energize one of said inductive loads while the remainder of said inductive loads remains unenergized;

cross-over means for connecting said energized inductive load to said input terminals of said d.c. pulse transformer means in response to said control means opening the connection of said battery and said one of said d.c. pulse transformer means so that the electrical energy in said inductive load will be transmitted to said input terminals including the input terminals of next sequentially operated d.c. pulse transformer means to be dissipated through the inductive load connected to said output terminals of said next sequentially operated d.c. pulse transformer means; and

battery protection means for preventing said electrical energy from said inductive load damaging said battery.

3,900,740

CONTROL DEVICE OF COPYING MACHINE

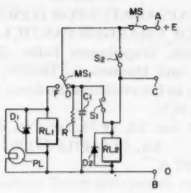
Hideo Akimoto, and Hiromitsu Kamiyama, both of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 6, 1974, Ser. No. 440,246

Claims priority, application Japan, Feb. 8, 1973, 48-16897

Int. Cl.² G03G *15/00*

U.S. Cl. 307—112 **5 Claims**



1. A control device for a copying machine comprising:

a switch movable from a first state to a second state when the copying machine has been operated for a predetermined number of cycles;

an indicator for indicating that the machine has been operated for said predetermined cycles, said indicator being inoperable when said switch is in said first state and operable when said switch is in said second state;

a stop signal causing means for generating signals for stopping the operation of the machine, said stop signal causing means being inoperable when said switch is in said first state and operable when said switch is in said second state; and

means for making said stop signal causing means inoperable when said switch is in said second state without changing the second state to the first state.

3,900,741

FAULT TOLERANT CLOCK APPARATUS UTILIZING A CONTROLLED MINORITY OF CLOCK ELEMENTS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration with respect to an invention of; William M. Daly, West Newton, and John F. McKenna, Jr., Gloucester, both of Mass.

Filed Apr. 26, 1973, Ser. No. 354,612

Int. Cl.² H02K *19/08;* **H03K** *19/42;* **G06F** *11/08*

U.S. Cl. 307—204 **5 Claims**

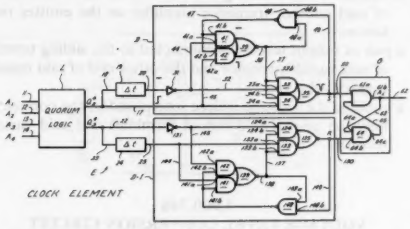
1. A fault tolerant clock apparatus for providing a digital clock signal despite a number r of failures of individual clock elements thereof, said apparatus comprising:

a plurality of n individual clock elements connected to each other to receive output clock signals from all of said plurality of clock elements, each of said clock elements including

quorum logic means for forming control signals responsive to transitions between digital logic levels in the output signals of a controlling minority of a number x of said individual clock elements,

output means comprising bistable digital logic means electrically connected to said quorum logic means for form-

ing the digital clock signal in response to the control signals from said quorum logic means wherein the clock signal is formed despite failure of individual clock elements in the clock apparatus, said quorum logic means forming a first of said control signals for setting the output bistable logic means to a first logic level in response to transitions in logic level of the controlling minority x of



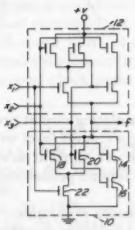
individual clock elements and said quorum logic means forming a second of said control signals for resetting the output bistable logic means to the second logic level in response to transitions in logic levels of an integral number y of clock elements wherein r, n, and x are positive integers, x is equal to or greater than $r+1$, n is equal to or greater than $3r+1$, and y is equal to or less than $n-r$.

3,900,742

THRESHOLD LOGIC USING COMPLEMENTARY MOS DEVICE

Daniel Hampel, Westfield; Kalman J. Prost, East Windsor, and Norman R. Scheinberg, Fort Lee, all of N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 24, 1974, Ser. No. 482,306
Int. Cl.² H03K *19/42, 19/08, 19/36*
U.S. Cl. 307—211 **7 Claims**



1. A majority logic gate for indicating when the sum of the integer weights of any one of a plurality of selected combinations of a multiplicity of weighted input signals is greater than half the sum of the weights of all of the input signals, said sum of the weights of all of the input signals being an odd integer comprising, in combination: first, second and output terminals;

a first network having a plurality of parallel-connected circuits, each of said first network circuits having a plurality of source-to-drain series-connected first network MOS devices of a first channel conductivity type, each of said first network MOS devices having a gate for receiving a respective one of said input signals associated with a respective one of said selected combinations, the source of the first MOS device in each of said first network circuits commonly connected to said first terminal and the drain of the last MOS device in each of said first network circuits commonly connected to said output terminal; and

a second network having a plurality of parallel-connected circuits, each of said second network circuits having a plurality of source-to-drain series-connected second network MOS devices of a second channel conductivity type opposite to said first channel conductivity type, each of said second network MOS devices having a gate for receiving a respective one of said input signals associated with a respective one of said selected combinations, the source of the first of said second network MOS device in each of said second network circuits commonly connected to said second terminal and the drain of the last MOS device in each of said seq$_0$nd network circuits commonly connected to said output terminal;

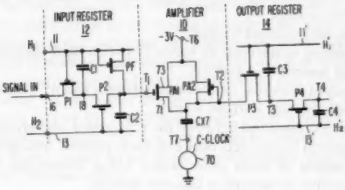
whereby said first and second networks for a complementary MOS circuit.

3,900,743

CHARGE AMPLIFIER

Paul Kessler Weimer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 31, 1973, Ser. No. 393,554
Claims priority, application United Kingdom, Sept. 25, 1972, 44294/72
Int. Cl.² G11C *19/28, 19/18;* **H01L** *29/78*
U.S. Cl. 307—221 D **9 Claims**



1. In combination with a charge transfer register comprised of insulated-gate field-effect devices having a capacitive terminal, means for amplifying the charge at said capacitive terminal, comprising:

an insulated-gate field-effect transistor of same conductivity type as said devices having first and second electrodes defining the ends of a conduction path and a control electrode;

means connecting said control electrode to said capacitive terminal;

a control terminal;

a capacitor whose capacitance is greater than the capacitance at said capacitive terminal;

means connecting said capacitor between said control terminal and one end of the conduction path of said transistor;

means for applying a control signal to said control terminal of a polarity and amplitude to operate said insulated-gate field-effect transistor in the source follower mode for producing a charge signal across said capacitor in phase with and directly proportional to the signal present at said capacitive terminal; and

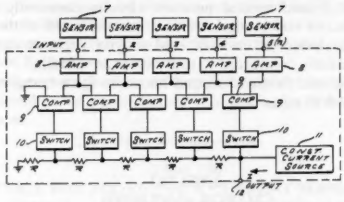
means connected across the conduction path of said transistor responsive to the termination of said control signal for restoring the charge condition existing across said capacitor prior to the application of said control signal.

3,900,744

HIGH SPEED ELECTRONIC CHANNEL DISCRIMINATOR

Uve H. W. Lammers, Chelmsford, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 4, 1974, Ser. No. 439,661
Int. Cl.[2] H03K 5/20
U.S. Cl. 307—235 R 1 Claim



1. A high speed parallel processor for determining the maximum signal output channel of a one-dimensional n-channel array comprising

a parallel array of n signal sensing devices,

a signal level comparator connected to compare the outputs of each adjacent pair of sensors, and a signal level comparator connected to compare the output of the first sensor with zero signal, each said comparator having first and second inputs and an output and being adapted to generate a switch actuating output signal only when the second input signal level is greater than the first input signal level,

means connecting the first and second inputs of adjacent comparators,

a constant current source,

n resistors connected in series between said constant current source and ground,

an output terminal connected between the n^{th} resistor and said constant current source,

a switch connected between the n^{th} resistor and ground, and a switch connected between each resistor and ground,

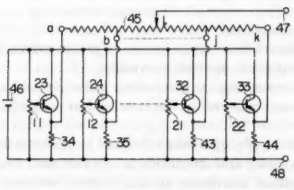
the output of each comparator being connected to and effective to actuate a discrete switch.

3,900,745

WAVEFORM GENERATOR

Takeshi Oku, Kawanishi, and Masaru Tanaka, Toyonaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 23, 1973, Ser. No. 381,569
Claims priority, application Japan, July 28, 1972, 47-76169; July 28, 1972, 47-76170
Int. Cl. H03k 1/14, 4/00
U.S. Cl. 307—260 1 Claim



1. A waveform generator comprising:

a plurality of emitter-follower type transistor amplifiers having their bases connected to respective variable voltage sources;

a multi-tapped potentiometer having a variable sliding terminal displaceable along substantially the entire length of said potentiometer and having a plurality of taps, each of said taps being connected to an emitter output of a respective one of said transistor amplifier, thereby providing an output of arbitrary waveform at the variable sliding terminal of said potentiometer;

another emitter-follower type transistor amplifier having a base connected to the sliding terminal of said multi-tapped potentiometer;

a variable resistor having one end connected to the emitter of said another transistor amplifier as the emitter resistance;

a pair of output terminals connected to the sliding terminal of said variable resistor and the other end of said resistor, respectively; and

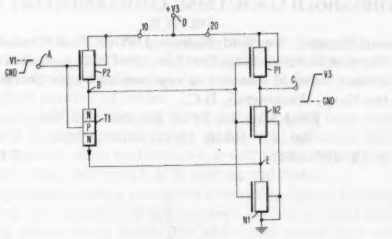
a variable d.c. voltage source interposed in the connection between one of said output terminals and said variable resistor.

3,900,746

VOLTAGE LEVEL CONVERSION CIRCUIT

Wayne R. Kraft, and Robert P. Lowden, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 3, 1974, Ser. No. 466,562
Int. Cl.[2] H03F 3/16, 3/18; H03K 3/14
U.S. Cl. 307—264 11 Claims



1. A voltage level translating circuit providing at its output terminal a signal having a voltage level within a first predetermined range in response to a signal at its input terminal having a voltage level within a second predetermined range comprising:

first and second reference potentials;

a bipolar transistor, said input signal being applied to the base of said bipolar transistor; a complementary field effect transistor inverter means including a first field effect transistor of a first channel type and a second field effect transistor of a second channel type complementary to said first channel type; said complementary field effect transistor inverter means connected to said first reference potential for generating said output signal, the gate electrodes of the complementary field effect transistors of said inverter means being connected to the collector of said bipolar transistor;

resistance means connected between the collector of said bipolar transistor and said first reference potential; and

variable current sink means connected to the emitter of said bipolar transistor and to said inverter means and being responsive to the voltage level at the collector of said bipolar transistor for holding said output terminal at said second reference potential when the bipolar transistor is non-conductive and for operating said bipolar transistor in the emitter-follower mode when said bipolar transistor is conductive.

3,900,747

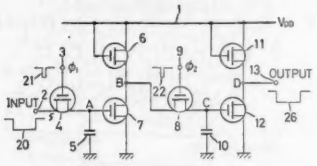
DIGITAL CIRCUIT FOR AMPLIFYING A SIGNAL

Hiroshi Yamazaki, and Tetsuo Ando, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 208,161, Dec. 15, 1971, abandoned. This application July 12, 1973, Ser. No. 378,512

Int. Cl. H03k 3/33; H01l 11/00

U.S. Cl. 307—304 2 Claims



1. A digital circuit for providing an output signal at a boosted level with respect to an input signal, comprising input and output terminals for respectively receiving the input signal and delivering the output signal, a MIS field effect transistor having a source-drain circuit connected between said input and output terminals, means for supplying a first clock pulse to the gate electrode of said MIS field effect transistor during the occurrence of said input signal, a semiconductor substrate of one conductivity type connected to ground, first and second diffusion regions of the opposite conductivity type formed in said substrate with a relatively small interval between said regions and with said second diffusion region being in an electrically floating state, an insulating layer on said substrate extending from over a part of said first diffusion region and over substantially the entire area of said second diffusion region and said interval, a conductive layer covering said insulating layer for forming a capacitance with the latter, means connecting said conductive layer to said output terminal, and means for supplying a second clock pulse to said first diffusion region, said first and second clock pulses being sufficiently different in phase to avoid overlapping thereof and the time interval from said second clock pulse to said first clock pulse determining the pulse width of a portion of said output signal, which is boosted with respect to said input signal by the magnitude of said second clock pulse.

3,900,748

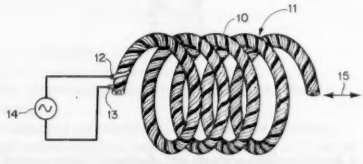
TORSIONAL CERAMIC TRANSDUCER

Robert Adler, Northfield, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 31, 1972, Ser. No. 222,201

Int. Cl.[2] H01L 41/04

U.S. Cl. 310—9.6 12 Claims



1. A transducer comprising:

a coiled element of ferroelectric material;

means, including a pair of electrodes spaced apart on a surface of said element and individually canted with respect to the centerline of said element, for inducing torsional stress about the coiled centerline of said element;

and terminal means for coupling a signal source to the electrodes in said pair to create change in elongation of said coil in the direction of its axis.

3,900,749

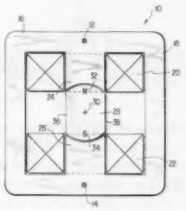
PERMANENT MAGNET GENERATOR

Roy C. Carriker, Lancaster, Pa., assignor to HMW Industries, Inc., Lancaster, Pa.

Filed Apr. 2, 1974, Ser. No. 457,163

Int. Cl. H02k 21/12

U.S. Cl. 310—156 18 Claims



1. An electromagnetic device for use as a generator or alternator comprising a plurality of magnetic laminations arranged to form a stack, each of said laminations being of at least substantially square configuration and formed as a single piece to reduce the magnetic reluctance of the lamination, each of said laminations having a pair of opposed legs with the legs of the laminations in said stack aligned to form a pair of opposed magnetic cores, a coil wound around each of said cores, the thickness of the coil around each core being at least approximately equal to the length of each core, and a permanent magnet rotor mounted for rotation between said cores, said rotor including a permanent magnet which is magnetized in a direction perpendicular to the rotational axis of said rotor, the spacing (A) between the tips of said cores being equal to the length (B) of the legs forming said cores which is in turn equal to the width (C) of said cores, and the width (D) of said frames being equal to at least approximately one-half the width (C) of said cores.

3,900,750

METAL HALIDE DISCHARGE LAMP HAVING HEAT ABSORBING COATING

William I. Bamberg, Medford, and William M. Keeffe, Rockport, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed June 3, 1974, Ser. No. 475,733

Int. Cl.[2] H01J 61/52

U.S. Cl. 313—44 6 Claims

1. An arc discharge lamp comprising an arc tube, made of high silica glass and having press seals at each end, containing a filling including inert starting gas, mercury and metal halide, having electrodes sealed therein at opposite ends and having a coating on the ends of said arc tube, said coating comprising

a first layer of a dark or gray heat absorbing material and a second layer of a white heat reflecting material, said dark or gray heat absorbing material comprising zirconium diboride.

3,900,751

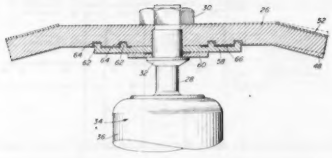
ROTATING ANODE X-RAY TUBE

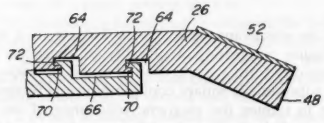
William P. Holland, West Readding; Robert E. Azud, Ridgefield, and Thomas J. Koller, Huntington, all of Conn., assignors to The Machlett Laboratories, Inc., Stamford, Conn.

Filed Apr. 8, 1974, Ser. No. 459,245

Int. Cl. H01j *35/04*

U.S. Cl. 313—60 **4 Claims**





1. An x-ray tube comprising an evacuated envelope containing an anode including a target, means for rotating said target about a perpendicular axis, cathode means spaced from said anode for generating a beam of electrons and directing same onto one side of said target, and retainer means engaging said target and physically restraining it from deformation resulting from heat generated by impingement of electrons thereon,

said retainer means comprising a member disposed adjacent the side of the target opposite the cathode means, the adjacent surfaces of said target and member having interfitting means for physically restraining the target from deformation when thermally stressed,

said interfitting means comprising at least one ridge on one of said adjacent surfaces and at least one aligned groove in the other of said adjacent surfaces, said ridge residing within said groove, said ridge and groove being provided with interlocking means.

3,900,752

GLOW DISCHARGE DISPLAY DEVICE WITH INTERSECTING ELECTRODE SYSTEMS SEALED BETWEEN OPPOSING PLATES

George Frederick Weston, Salfords, near Redhill, England, assignor to U.S. Philips Corporation, New York, N.Y.

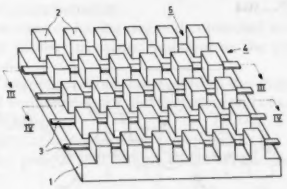
Filed Nov. 1, 1973, Ser. No. 411,760

Claims priority, application United Kingdom, Nov. 20, 1972, 53508/72

Int. Cl. H01j *17/00*

U.S. Cl. 313—188 **10 Claims**

1. A glow discharge display device comprising first and second substantially parallel electrically insulating plates facing one another with a discharge gas atmosphere between them, first and second sets of elongate electrical conductors extending between and substantially parallel to the plates with the conductors of the first set spaced from and crossing those of the second set to form a cross-bar addressing system for the resulting array of electric discharge paths through said atmosphere defined by the effective cross-points of the conductors of the first set with those of the second, the surface of the first plate which faces the second plate comprising an array of electrically insulating posts thereon which extend between the conductors of the first set towards the second plate, the conductors of the second set running between the end of said posts and the second plate so that each part of each conductor of the second set which links a pair of adjacent said cross-points is situated between the end of an individual post and the



second plate, and members on said second plate of electrically insulating material extending in the length direction of the conductors of the second set to fill the space formed by the array of insulating posts in the direction perpendicular to the first set of conductors.

3,900,753

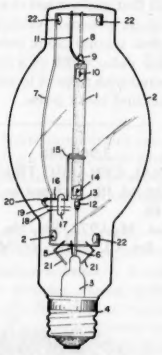
HIGH PRESSURE SODIUM VAPOR LAMP HAVING LOW STARTING VOLTAGE

Donald A. Richardson, Beverly, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed May 28, 1974, Ser. No. 473,613

Int. Cl. H01j *61/54*

U.S. Cl. 313—198 **5 Claims**



1. A high pressure sodium arc discharge lamp comprising an alumina arc tube disposed within an outer jacket, the arc tube having an electrode at each end and containing a fill including sodium, mercury and a Penning gas mixture; a wire ring starting aid encircling the arc tube, more proximate one electrode than the other, and electrically connected to said other electrode through a temperature actuated switch which is normally closed at room temperature and which is open during normal lamp operation, thereby electrically disconnecting the wire ring starting aid.

3,900,754

ELECTRIC DISCHARGE LAMP

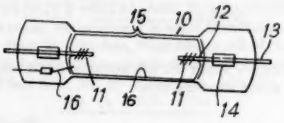
David Robert Mason; Susan Margaret Cole, both of Runcorn; Maurice Arthur Cayless, and David Osborn Wharmby, both of London, all of England, assignors to Thorn Lighting Limited, London, England

Filed Jan. 18, 1974, Ser. No. 434,382

Claims priority, application United Kingdom, Jan. 19, 1973, 2953/73

Int. Cl. H01j *61/33*

U.S. Cl. 313—221 9 Claims



1. An electrical discharge lamp comprising: an arc tube;
components including a pair of spaced electrodes in said arc tube and respective conductive leads or supports for said electrodes;
a gaseous fill in said tube;
and a transparent, defect-free, solution-deposited protective coating of a vitreous compound selected from metal phosphates and arsenates on at least the internal surface of the arc tube and the exposed surfaces of said lead or supports which tend to react with said fill during operation of the lamp.

3,900,755

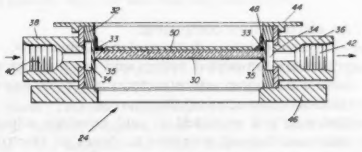
ARC SUPPRESSING COATING FOR METAL-DIELECTRIC INTERFACE SURFACES

Lawrence H. Tisdale, Wakefield, and Leonard Lesensky, Lexington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed June 26, 1972, Ser. No. 266,003

Int. Cl. H01p *1/00, 7/06*

U.S. Cl. 313—212 3 Claims



1. An electromagnetic energy electron discharge device comprising:
an evacuated envelope having an access opening;
a high power window assembly for sealing said access opening including a body of a dielectric material permeable to electromagnetic wave energy and hermetically joined to a support body of a metallic material; and
a coating of an oxide of a dielectric material selected from the group including silicon, alumina and titanate disposed solely on the interface surfaces of said joined bodies to be exposed to vacuum to substantially reduce surface electric field strengths in the interface regions;
said coating having a thickness averaging in the range of about 1,000–2,000 Angstrom units.

3,900,756

LONG-LIFE CARBON ELECTRODES FOR WEATHER TESTER AND THE LIKE

Shigeru Suga, Yoyogi 5-20-2, Shibuya-Ku, Tokyo, Japan

Filed Oct. 7, 1974, Ser. No. 512,882

Int. Cl. H05b *31/10;* H01j *1/02*

U.S. Cl. 313—354 1 Claim

1. In a carbon arc lamp for use in weather testers and the like and including pairs of upper and lower electrodes, each of said upper and lower electrodes comprised of a core portion formed of a luminous material, a carbonaceous portion surrounding said core portion and a layer of copper or like material positioned over said carbonaceous portion, the improvement which comprises the diameter ratio of the upper to the lower electrodes being within the range of 1.4 – 1.6 : 1.0, and the ratio of the sectional area of the carbonaceous portion to that of the core portion in the upper carbon electrodes being within the range of 9 – 14 : 1 with the ratio in the lower carbon electrodes being within the range of 5 – 9 : 1, whereby an improved carbon electrode combination is provided in which the upper and lower carbon electrodes have the same rate of combustion to length and can provide spectroscopically stabilized light at a discharge voltage and current of 50 V and 60A respectively, normally used in weather testers, and which also has improved long-life performance in excess of 24 hours of continuous lighting.

3,900,757

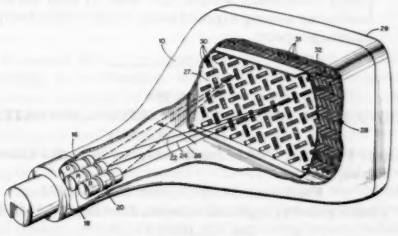
SHADOW MASK AND PHOSPHOR SCREEN FOR COLOR CATHODE RAY TUBE HAVING MAJOR AXES OF APERTURES AND ELEMENTS CANTED TO BEAM SCAN DIRECTION

Sam H. Kaplan, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed June 20, 1973, Ser. No. 371,901

Int. Cl.[2] H01J *29/07, 29/30, 31/20*

U.S. Cl. 313—402 25 Claims



1. A shadow mask for use in a color cathode ray tube, comprising a sheet of electrically conductive material having formed therein a plurality of rows of elongated, equally spaced, electron-transmissive apertures which are arranged such that the major axes of the apertures in each row are parallel and canted relative to the direction of electron beam scan across the mask, the apertures in any given row having an angle of canting which is of opposite polarity to the angle of canting of the apertures in adjoining rows.

3,900,758

GASEOUS DISCHARGE DISPLAY PANEL WITH FLUORESCENT BODIES SURROUNDED BY LIGHT ATTENUATING MATERIAL

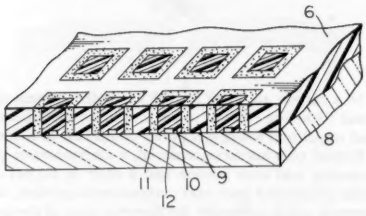
Shizuo Andoh, and Norihiko Nakayama, both of Kobe, Japan, assignors to Fujitsu Ltd., Tokyo, Japan

Filed Mar. 22, 1973, Ser. No. 343,699

Claims priority, application Japan, Mar. 27, 1972, 47-29761

Int. Cl. H01j *61/42*

U.S. Cl. 313—485 **11 Claims**



1. A matrix type display panel utilizing surface discharge comprising,

a. a pair of dielectric substrates facing each other, at least one of said dielectric substrates being transparent,

b. X electrodes which are provided on one of said substrates,

c. a first dielectric layer covering said electrodes,

d. Y electrodes disposed parallel to one another and at right angles to said X electrodes on said first dielectric layer so that discharge parts of said X electrodes are formed on the co-planar surface with said Y electrodes through said first dielectric layer near each crossing portion of said X and Y electrodes,

e. a second dielectric layer which covers said X and Y electrodes so that a discharge space is formed between the other of said dielectric substrates and said second dielectric layer,

f. an ionizable gas in said discharge space,

g. means for sealing said gas within said space,

h. fluorescent bodies corresponding to every discharge part on the inside surface of said other dielectric substrate and

i. a layer of ultra-violet light-attenuating material disposed completely around the sides of said fluorescent bodies but leaving exposed ends of said bodies facing said discharge space.

3,900,759

DEVICE FOR OBSERVING WAVEFORM REPEATED AT HIGH FREQUENCY

Kazuo Fujisawa, Osaka, Japan, assignor to Osaka University, Osaka, Japan

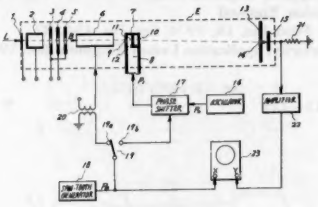
Filed Mar. 14, 1974, Ser. No. 450,972

Claims priority, application Japan, June 25, 1973, 48-71539

Int. Cl. H01j *31/26*

U.S. Cl. 315—10 **4 Claims**

1. A device for observing a waveform repeated at a high frequency, comprising means of producing an electron beam having a density variation according to the waveform to be observed, means for generating a microwave voltage which is synchronous with the repetition rate of the waveform to be observed, means for deflecting said electron beam under control of said microwave voltage, means for sweeping the phase difference between said electron beam and microwave voltage at a low frequency, means for collecting said electron beam only at a position corresponding to a predetermined deflection effected by said deflecting means, and means for displaying the magnitude of the electron flow collected by said



collecting means along the phenomenon axis and said phase difference along the time axis.

3,900,760

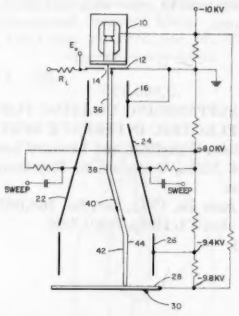
ELECTRON BEAM TUBE HAVING POST DEFLECTION LENS

William E. Glenn, Jr., Stamford, and Robert E. Rutherford, Jr., New Canaan, both of Conn., assignors to CBS Inc., New York, N.Y.

Division of Ser. No. 159,132, July 2, 1971, abandoned. This application Mar. 12, 1973, Ser. No. 340,154

Int. Cl.[2] H01J *29/70*

U.S. Cl. 315—17 **8 Claims**



1. An electron tube comprising:

an elongated envelope having a longitudinal axis;

target means supported within said envelope at one end thereof having an unobstructed surface for receiving an electron beam scanned thereacross;

an electron gun mounted in said envelope adjacent the other end thereof operative to direct an electron beam along said longitudinal axis;

electrostatic focusing means mounted within said envelope adjacent said electron gun and disposed around said longitudinal axis for focusing said electron beam onto the surface of said target means;

electrostatic deflection means mounted within said envelope adjacent said electrostatic focusing means and disposed around said longitudinal axis for scanning said electron beam across the surface of said target means, said deflection means having a center of deflection positioned on said longitudinal axis;

electrostatic lens means including a conductive structure mounted within said envelope and surrounding said longitudinal axis outside the path of said electron beam for all scanning positions thereof and axially disposed between and in proximity with the surface of said target means and said deflection means; and

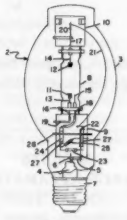
means for applying to said conductive structure, to said deflection means and to the unobstructed surface of said target means predetermined potentials having values related to each other to cause the focal point of said electrostatic lens means to be substantially coincident with the center of deflection of said deflection means, to cause an electron beam deflected by said deflection means to be diverted into a path normally incident upon the surface of said target means and to decelerate said normally incident beam to substantially zero velocity at the surface of said target means.

3,900,761

HIGH INTENSITY METAL ARC DISCHARGE LAMP

Robert W. Freese, Manchester; Ronald C. Lekebusch, Goffstown, and Paul W. Ulcickas, Manchester, all of N.H., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 30, 1973, Ser. No. 420,671
Int. Cl. H05b *37/00*
U.S. Cl. 315—60 **2 Claims**



1. A metal halide arc discharge lamp comprising: an arc tube containing an ionizable discharge-sustaining fill including mercury and a metal halide; a first and a second main electrode disposed within the arc tube; a starter electrode disposed within the arc tube adjacent the first main electrode; and an electrical circuit within said lamp, said circuit capable of increasing the peak starting voltage applied between said first main and starter electrodes above the peak voltage applied by an external power supply during normal operation of said lamp, said circuit including a diode and two resistors, the diode and one of said resistors being in series between said first main electrode and said starter electrode, and said two resistors being in series between said starter electrode and the external lead-in wire for said starting electrode.

3,900,762

METHOD AND APPARATUS FOR PROJECTING MATERIALS INTO AN ARC DISCHARGE

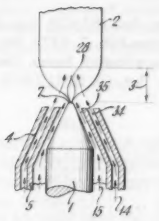
Charles Sheer, Teaneck, N.J.; Samuel Korman, Hewlett, N.Y.; Derek J. Angier, Peapack, and Robert P. Cahn, Millburn, both of N.J., assignors to Sheer-Korman Associates, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 159,616, July 6, 1971, abandoned. This application Aug. 30, 1973, Ser. No. 392,928
Int. Cl. H05b *31/26;* **H05h** *1/00*
U.S. Cl. 315—111 **13 Claims**

1. A process for energizing fluid medium in the conduction column of a free-burning electric arc comprising: establishing an arc discharge between an anode and a cathode having a conical tip whereby a plasma bubble is formed at the cathode tip and whereby said arc discharge forms a contraction of the current-carrying area in the transition region in the vicinity of the cathode;

forcefully projecting fluid medium along the surface of said conical tip of said cathode into and through the contraction of the current-carrying area in the transition region in the vicinity of the cathode and along a path which intersects above the plasma bubble; and

simultaneously interposing between said fluid medium and said conical tip of said cathode in a direction parallel to



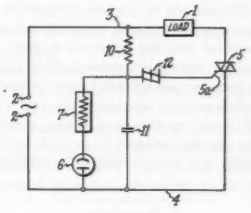
the surface of said conical tip a stream of gas that is chemically inert toward the cathode material during operation.

3,900,763

LIGHTING CONTROL DEVICE

Charlie B. Turner, Hendersonville, N.C., assignor to General Electric Company, N.Y.

Filed May 9, 1974, Ser. No. 468,392
Int. Cl.² H05B *37/02*
U.S. Cl. 315—156 **11 Claims**



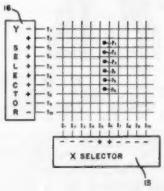
1. A control device for controlling the operation of a load comprising, in combination, a source of alternating current, load means energized by said alternating current source, controlled switch means connected in series with said alternating current source and said load means and being normally nonconductive to block current flow to said load means and having control electrode means to render it conductive, actuating means connected to said alternating current source and to said control electrode means for applying a control signal to said control electrode means, said actuating means including a resistance and a capacitance connected together in series and voltage sensitive symmetrical switch means connected to the junction of said resistance and capacitance and to said control electrode means being in series discharge relation with said capacitance, and sensor circuit means including sensor means and snap-action symmetrical switch means connected in series across said capacitance, said snap-action symmetrical switch means operating to turn said controlled switch means, and thereby said load means, on and off with rapid switching action at threshold ambient conditions to which said sensor means is responsive.

3,900,764

CATHODE RAY TUBES FOR DISPLAYING LETTERS AND THE LIKE

Mikiharu Tanji; Yoshimasa Yamanaka, and Isao Takahashi, all of Ise, Japan, assignors to Ise Electronics Corporation, Ise, Japan

Continuation of Ser. No. 103,679, Jan. 4, 1971, abandoned. This application Feb. 7, 1973, Ser. No. 330,303
Claims priority, application Japan, Jan. 27, 1970, 45-6846
Int. Cl. H01j 29/70
U.S. Cl. 315—365 3 Claims



1. In a cathode ray tube for displaying letters of the type comprising an evacuated envelope having a display screen at one end thereof, a cathode electrode at the other end for emitting electrons and an electron lens system including deflection means, the improvement which comprises pattern forming means positioned between said cathode electrode and said electron lens system, said pattern forming means including an insulator substrate provided with a plurality of perforations arranged in a matrix, and a plurality of groups of parallel conductors disposed on the opposite sides of said substrate to form rows and columns of said matrix, each one of said perforations being positioned in a square defined by two pairs of parallel conductors belonging to different groups; and means for selectively applying potentials of the same or opposite polarities upon all of said parallel conductors to cause selected ones of said perforations in squares defined by pairs of said selected conductors on opposite sides of said substrate energized with the same polarity potential to have a superposed positive field of predetermined magnitude to permit said electrons to pass through said selected ones of said perforations toward said display screen to display thereon a desired letter, the remainder of said perforations having a superposed field intensity that is negative relative to any value of field intensity greater than half said positive field of predetermined magnitude.

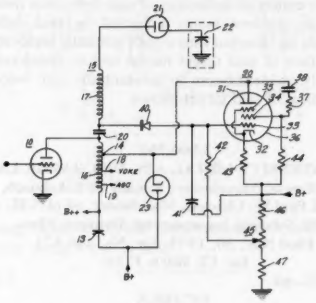
3,900,765

HIGH VOLTAGE PULSE REGULATOR

Stanley Bart, Chicago, and Raymond J. Magdziarz, Wood Dale, both of Ill., assignors to Admiral Corporation, Schaumburg, Ill.

Continuation of Ser. No. 130,081, April 1, 1971, abandoned. This application June 11, 1973, Ser. No. 368,957
Int. Cl. H01j 29/70
U.S. Cl. 315—411 2 Claims

1. In a color television receiver including a picture tube: a high voltage system comprising an autotransformer having a first winding and a second winding; a first capacitor connected between said first and second windings; an amplifier connected to said first winding for driving said transformer with an oscillatory signal; a deflection yoke coupled to said first winding; a damper connected across a portion of said first winding cooperating with said amplifier and deflection yoke to produce a scan voltage having a waveform characterized by a slowly rising trace portion and a rapidly decaying retrace portion; rectifying means coupled to said second winding developing high voltage DC current for said picture tube; a sensing diode with one side connected to the junction between said second winding and said first capacitor, a voltage regulating vacuum tube with its control grid connected to the second side of said sensing diode; a first resistor connected between the cathode and control grid of said voltage regulating vacuum tube; a second capacitor; and a second resistor connected in



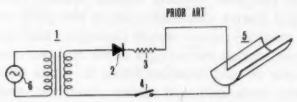
series with said second capacitor between the anode and cathode of said voltage regulating vacuum tube to shape keying pulse.

3,900,766

CORONA DISCHARGE APPARATUS FOR PARTICLE COLLECTION

Takehiko Kawada, Yokohama, Japan, assignor to Denki Onkyo Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 228,638, Feb. 23, 1972, abandoned. This application Nov. 2, 1973, Ser. No. 412,180
Claims priority, application Japan, Mar. 3, 1971, 46-13943; Feb. 26, 1971, 46-11648
Int. Cl. H01t 19/00
U.S. Cl. 317—3 2 Claims

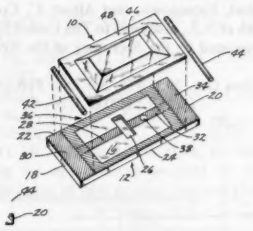


1. An electrostatic precipitator comprising:
a source of alternating low voltage with one grounded terminal;
a high voltage ceramic piezoelectric transformer having input terminals connected across said low voltage and a high voltage, high impedance output terminal with no DC connection to ground;
rectifier means coupled to said output terminal including voltage multiplier means for producing relative to ground a high direct output voltage and an intermediate direct potential;
an atmospheric ionizing device having spaced electrodes one of which is grounded connected across said high direct output voltage and operative to electrostatically charge particles suspended in the medium between said electrodes; and
a particle collector having spaced electrodes one of which is grounded connected across said high direct output voltage and a third electrode positioned between said spaced electrodes and connected to be maintained at said intermediate direct potential;
the grounded electrodes of said device and said collector being directly connected to said grounded terminal.

3,900,767
SURGE ARRESTOR

Herman R. Person, Columbus, Nebr., assignor to Dale Electronics, Inc., Columbus, Nebr.

Filed Apr. 26, 1973, Ser. No. 354,483
Int. Cl. H02h *1/04, 3/22*
U.S. Cl. 317—61.5 13 Claims

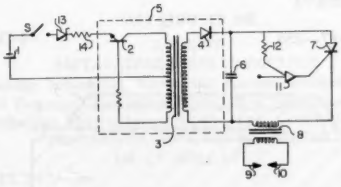


1. A surge arrestor comprising,
a flat substrate material having a top surface and opposite ends, said substrate material having a spark gap notch formed in its top surface, a first electrode on said top surface extending from one side of said notch towards one end of said substrate material,
a second electrode on said top surface extending from the other side of said notch towards the other end of said substrate material,
first and second leads secured to said first and second electrodes respectively,
and a sealed cover means secured to said top surface extending over said notch, said cover means being secured at its periphery to said top surface and being positioned between said first and second leads.

3,900,768
ELECTRIC SPARK GENERATING DEVICE FOR IGNITORS

Nobuyoshi Moriya, Omiya, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Saitama, Japan

Filed Sept. 12, 1974, Ser. No. 505,377
Claims priority, application Japan, Sept. 19, 1973, 45-109235[U]
Int. Cl. F23q *3/00*
U.S. Cl. 317—96 7 Claims

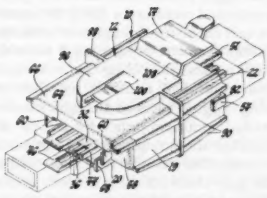


1. An electric spark generating device for ignitors comprising:
a power supply;
a switch means connected in series with said power supply;
inverter means connected to said switch means;
a diode connected in series with said inverter means;
a condenser means connected to said diode to store a charge voltage supplied from said power supply;
a silicon controlled rectifier connected to said condenser means to discharge the charge voltage on said condenser means;
a trigger means connected to the gate of said silicon controlled rectifier to trigger said silicon controlled rectifier at a predetermined level of the charge voltage on said condenser means; and
a step-up transformer having a primary winding and a secondary winding, the primary winding of said step-up transformer being connected between the cathode electrode of said silicon controlled rectifier and said condenser means and the secondary winding of said step-up transformer being connected to ignition electrodes.

3,900,769
ELECTRONIC MODULAR PACKAGE HAVING A PRINTED CIRCUIT ASSEMBLY

Andrew Russo, Jr., Fowler, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 13, 1974, Ser. No. 478,839
Int. Cl.[2] H02B *1/02*
U.S. Cl. 317—101 DH 2 Claims

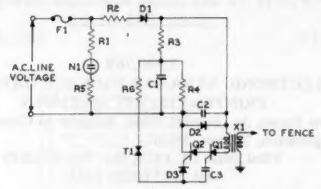


1. An electronic modular package having a printed circuit assembly comprising:
a hard circuit board having first and second terminal blocks secured thereto adjacent the opposite ends thereof respectively, said first terminal block having a width less than that of the end portion of said circuit board to which it is secured, said second terminal block having a width greater than the width of said first terminal block and slightly greater than the maximum width of said circuit board.
a rigid plastic, hollow elongated housing of generally rectangular cross section having a larger opening at one end and a smaller opening at an opposite end, said circuit board being disposed in said housing by sliding said circuit board with said first and second terminal blocks secured thereto into said housing through said larger opening first terminal block first until said first terminal block is disposed in said smaller opening and said second terminal block is disposed in said larger opening.
latch means comprising cooperative portions of said first terminal block and portions of said housing adjacent said smaller aperture for securing said circuit board within said housing, said latch means constituting the sole means preventing withdrawal of said circuit board whereby said circuit board is substantially isolated from forces associated with pushing a mating connector onto said first terminal block, and
stop means comprising cooperative portions of said second terminal block and said housing adjacent said larger opening for limiting insertion of said circuit board into said housing, said stop means constituting the sole means limiting insertion of said circuit board into said housing whereby said circuit board is substantially isolated from forces associated with pushing a mating connector onto said second terminal block.

3,900,770
ELECTRIC FENCE SHOCKER CIRCUIT

Lance R. Kaufman, Milwaukee, Wis., assignor to Gentron Corporation, Milwaukee, Wis.

Filed Jan. 18, 1974, Ser. No. 434,479
Int. Cl. H03k 17/56
U.S. Cl. 317—148.5 B 2 Claims

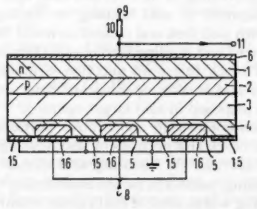


1. In an electric fence shocker circuit including a capacitor, a transformer primary winding, and a silicon controlled rectifier, means connecting said capacitor, said transformer primary winding, and the anode-cathode circuit of said silicon controlled rectifier together in series, means for charging said capacitor, and trigger means coupled to the gate electrode of said silicon controlled rectifier for firing the same to discharge the charge on said capacitor through said transformer primary winding, the improvement comprising a second silicon controlled rectifier, means connecting the anode-cathode circuit of both silicon controlled rectifiers together in series, and means coupling trigger pulses to the gate electrodes of both silicon controlled rectifiers, whereby if one of the silicon controlled rectifiers should suffer an interim mode failure, the other silicon controlled rectifier will hold said series circuit open until the gate electrode of said other silicon controlled rectifier is triggered by said trigger means, there being a capacitor connected in series with the gate electrode of one silicon controlled rectifier and a diode connected in series with the gate electrode of the other silicon controlled rectifier.

3,900,771
TRANSISTOR WITH HIGH CURRENT DENSITY

Gerhard Krause, Ebersberg, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Continuation of Ser. No. 198,313, Nov. 12, 1971, abandoned.
This application July 30, 1973, Ser. No. 383,792
Claims priority, application Germany, Nov. 25, 1970, 2058070
Int. Cl. H01l 11/00
U.S. Cl. 357/7 9 Claims

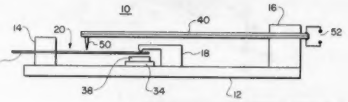


1. A continuously controllable transistor comprising a first emitter zone, a base zone, a collector zone and a second emitter zone successively superposed one on the other, a collector-base barrier layer disposed between said base zone and said collector zone, means for applying a voltage across said superposed zones with increased current density in the collector-base barrier layer, in which, when in operation, the ratio of the current of charged particles of one conductivity type (i_1), from the base zone to the collector zone, to the current of charged particles of the other conductivity type (i_2), from the collector zone to the base zone, approximately equals the ratio of the drift velocities of the particles of said one conductivity type and of said other conductivity type in the collector-base barrier layer.

3,900,772
DIGITALLY VARIABLE CAPACITOR

Josef H. Anderl, Eatontown, and Albert C. Colaguori, Long Branch, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 29, 1974, Ser. No. 518,448
Int. Cl.[2] H01G 5/16
U.S. Cl. 317—250 4 Claims

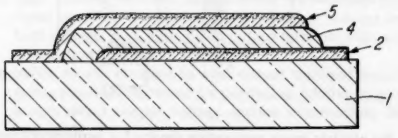


1. A digitally variable capacitor comprising:
a sheet metal comb having a rigid spine and a plurality of flexible parallel resilient fingers;
each of said fingers being of equal length, the free ends of said fingers each being capacitor elements of different areas;
a rigid common capacitor electrode for said capacitor elements;
a thin dielectric member affixed to said common capacitor electrode located between the common capacitor electrode and the capacitor elements, the capacitor elements being normally urged by the respective fingers away from the dielectric member, and
an independently controllable activator for each finger of said comb for selectively forcing the respective capacitor element into engagement with the dielectric member or for releasing the finger.

3,900,773
ELECTRICAL CAPACITORS

Ian G. Bowkley, and Nigel J. Goff, both of Leatherhead, England, assignors to E. R. A. Patents Limited, Leatherhead, England

Filed June 11, 1973, Ser. No. 368,833
Claims priority, application United Kingdom, June 12, 1972, 27298/72
Int. Cl. H01g 1/01
U.S. Cl. 317—258 2 Claims



1. In an electrical capacitor comprising a ceramic substrate, a base electrode comprising a layer of finely divided precious metal, a first layer of glass adhering said base electrode to said substrate; a layer of glass-ceramic high permittivity dielectric comprising a fine dispersion of high permittivity ferroelectric crystals throughout said layer; a top electrode comprising a layer of finely divided precious metal and a second layer of glass adhering said top electrode to said layer of dielectric; the improvement which comprises said second layer of glass having the ability to soften in the temperature range 700°–850°C and on further heating to re-crystallize at temperatures below

1,000°C of compositions selected from the group consisting of

A. 45.4% Nb_2O_5, 8.9% SiO_2, 13.8% BaO, 19.6% PbO, 7.9% SrO, 1% Al_2O_3 and 3.5% B_2O_3;

B. 45.4% Nb_2O_5, 4.4% SiO_2, 13.8% BaO, 19.6% PbO, 7.9% SrO, 1% Al_2O_3, 8.0% B_2O_3;

C. 45.5% Nb_2O_5, 8.9% SiO_2, 13.8% BaO, 19.7% PbO, 7.9% SrO and 4.2% B_2O_3;

D. 62.2% Nb_2O_5, 9.7% Na_2O, 10% CdO, 6% TiO_2 and 12% SiO_2;

E. 60.7% Nb_2O_5, 9.4% Na_2O, 9.6% CdO, 12% SiO_2 and 8.3% Ta_2O_5;

F. 44% Nb_2O_5, 8.6% SiO_2, 16.1% BaO, 23.1% PbO, 3.8% SrO, 1% Al_2O_3 and 3.4% B_2O_3;

G. 45.2% Nb_2O_5, 8.8% SiO_2, 8% BaO, 23.8% PbO, 9.8% SrO, 1% Al_2O_3 and 3.5% B_2O_3;

H. 47.1% Nb_2O_5, 9.2% SiO_2, 17.3% BaO, 11.6% PbO, 10.2% SrO, 1% Al_2O_3 and 3.6% B_2O_3, the stated percentages being the approximate percent by weight of the listed ingredients in said second layer of glass.

3,900,774

OIL-IMPREGNATED CAPACITOR

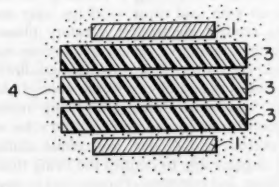
Yasuo Iijima, Kobe, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 26, 1973, Ser. No. 427,690

Claims priority, application Japan, Dec. 28, 1972, 47-3328; Feb. 5, 1973, 46-14890; Sept. 18, 1973, 46-105730

Int. Cl. H01g *3/195*

U.S. Cl. 317—258 **6 Claims**



1. An oil-impregnated capacitor having a thin insulator sheet sandwiched between two electrodes, said thin insulator sheet consisting of a plastic film having haze no lower than 20 percent.

3,900,775

METALLIZED FILM CAPACITOR

Kazushige Takashima, Kawanishi; Katumi Nishigaki, Ikeda, and Terumasa Yamashita, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 24, 1974, Ser. No. 482,585

Int. Cl. H01g *3/175*

U.S. Cl. 317—258 **2 Claims**

1. A metallized film capacitor comprising a polyethylene terephthalate film both sides of which are metallized, and a non-metallized polypropylene film, both said films being wound at the same time, the thickness of said polypropylene film being 70 to 90% of that of said polyethylene terephthalate film.

3,900,776

PROCESS AND APPARATUS FOR PROLONGING THE USEFUL LIFETIME OF A REPEATEDLY CHARGED ELECTROPHOTOGRAPHIC LAYER

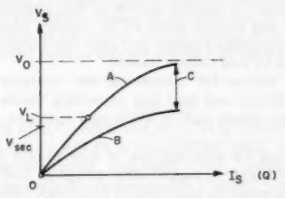
Willi Lanker, Zumikon, Switzerland, assignor to Turlabor AG, Zumikon, Switzerland

Filed Sept. 17, 1973, Ser. No. 398,134

Claims priority, application Switzerland, Oct. 16, 1972, 15081/72

Int. Cl. H01t *19/00*

U.S. Cl. 317—262 A **16 Claims**



1. Apparatus comprising:

a holding device receiving a layer thereon;

a charging device including means for charging the layer to a voltage value (V_1) less than the new value (V_o) of the layer's saturation voltage so that the secondary corona current (I_{scr}) is at most 10% of the current (I_s) flowing to the layer;

the charging device including a control electrode having openings therein with such openings in at least a part thereof being of a size (w) less than 1.7 millimeters; and the electrode being spaced less than 4 millimeters from the layer and being arranged equidistant therefrom on the side of the layer facing the charging device.

3,900,777

FEED CONTROL APPARATUS FOR A GRINDING MACHINE

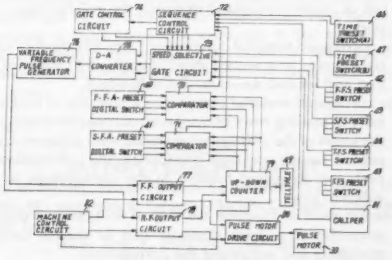
Hirotaka Sumi, Nagoya; Isao Suzuki, Okazaki; Isamu Yokoe, Obu, and Tetsuo Matsuzaki, Nishio, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Japan

Filed Oct. 26, 1973, Ser. No. 410,283

Claims priority, application Japan, Oct. 28, 1972, 47-108219

Int. Cl. G05b *19/24*

U.S. Cl. 318—39 **13 Claims**



1. Feed control apparatus for a grinding machine having tool and workpiece supports which respectively support a tool and a workpiece, comprising:

variable frequency pulse generating means for generating a series of pulse signals;

caliper means for measuring said workpiece and for generating a plurality of caliper signals when said workpiece is ground to predetermined sizes;

a stepping motor for causing relative motion between said supports in response to said pulse signals;

counter means for counting the number of said pulse signals supplied to said stepping motor to detect a distance between said supports;

first presetting means for digitally presetting feeding amounts through which said supports are relatively moved from each other before the caliper signal is generated by said caliper means;

second presetting means for digitially presetting first and second series of feeding speeds of said stepping motor, said first and second series of the feeding speeds being respectively utilized before and after said caliper signal is generated by said caliper means;

comparing means for comparing the contents of said counter means and said first presetting means and for generating match signals when said contents coincide; and

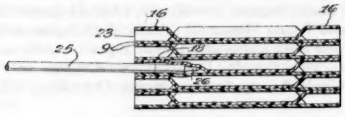
control means for selecting one of said second presetting means to supply a digital value preset in said selected presetting means to said variable frequency pulse generator in response to said match signals and said caliper signals in order to perform the relative motion between said supports at the feeding speed directed by said digital value.

3,900,778

ARCHERY TARGET MATS OF STAGGERED CORRUGATED PLASTIC

Ralph C. Bruner, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 7, 1973, Ser. No. 422,906
Int. Cl.[2] F41J *3/00*
U.S. Cl. 273—102 B **14 Claims**



1. A target mat for projectile comprising:

a roll of fluted corrugated material, the roll having a core portion,

the corrugated material comprising a first flat sheet of material adhered to a second sheet of corrugated material, the first and second sheets having side edges,

the corrugated material comprising a plurality of longitudinally extending rows of staggered corrugations along the thickness of the corrugated material, with adjacent corrugations having common boundaries, the corrugations in each row staggered relative to the corrugations in any adjacent row,

wherein each corrugation has a cross section such that the projectile of a given diameter can fit therein only by stretching and deforming the corrugation,

the corrugated material being spirally bound in the roll, whereby layers of corrugations are superimposed one over the other,

means to fasten the layers together to prevent their coming apart, and

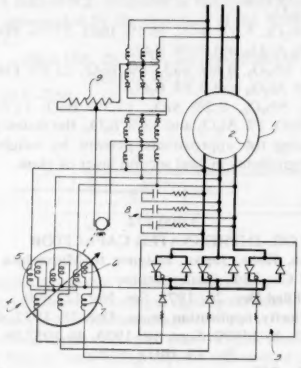
the side edges of the first and second sheets of the roll defining the target mat surface and back.

3,900,779

STARTING AND REGULATOR DEVICE FOR ASYNCHRONOUS MOTORS WITH A WOUND ROTOR

Ivan Yakovlev Kondratenko, Sofia, Bulgaria, assignor to Nipkiep, Sofia, Bulgaria

Filed Aug. 18, 1972, Ser. No. 281,997
Claims priority, application Bulgaria, Aug. 25, 1971, 18434
Int. Cl. H02k *17/34*
U.S. Cl. 318—197 **3 Claims**



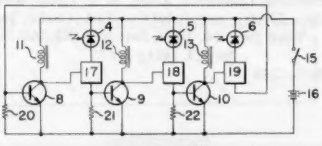
1. A control system for an asynchronous motor having stator and rotor windings, a voltage being applied to said rotor windings, said system comprising a plurality of controlled rectifiers in circuit with said rotor windings, said controlled rectifiers having control electrodes; a rotary phase shifter having rotor windings inductively energized in response to the voltage applied to the motor rotor windings and directly connected through resistors and diodes to the control electrodes of said rectifiers, said control electrodes being unconnected except for the connections to said phase-shifter rotor windings through said resistors and diodes, said phase shifter rotor being angularly displaceable to control the firing time of said controlled rectifiers; and condensers connected in circuit with the motor rotor windings.

3,900,780

CONTROL CIRCUIT FOR ELECTRIC MOTORS

Kinzi Tanikoshi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed Feb. 5, 1973, Ser. No. 329,843
Claims priority, application Japan, Feb. 3, 1972, 47-12409
Int. Cl. H02k *29/00*
U.S. Cl. 318—254 **12 Claims**



1. A control circuit for an electric motor having a plurality of driving coils and a rotor driven by the successive energization of said coils, said control circuit comprising:

a plurality of switching means, each arranged to control the energization of a different one of said coils,

a plurality of tranducers, each arranged to produce output control signals for actuation of an associated one of said switching means during the turning of said rotor through a different sector, said transducers being arranged such

that their respective control signal producing sectors overlap whereby, at different intervals of rotor movement, output control signals are produced simultaneously by two transducers whose switching means produce successive coil energization,

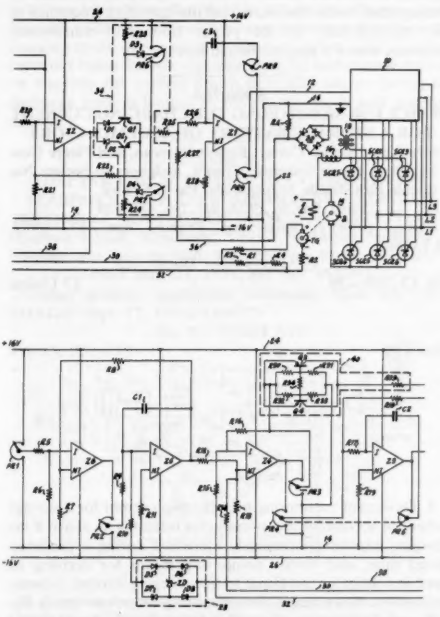
and gating means having two inputs connected respectively to receive signals indicative of the outputs of each of said two transducers to prevent actuation of the switching means associated with one of said two transducers in response to control signal outputs from the other of said two transducers, said gating means having an output connected to the switching means associated with said one transducer to permit actuation of said switching means by control signal outputs from said one transducer in the absence of control signal outputs from said other transducer whereby a uniform and continuous energization, in succession, of said coils is presented to said rotor.

3,900,781

MOTOR SPEED CONTROL SYSTEM WITH TIMED SPEED REFERENCE CLAMP AND SPEED ERROR SPILL-THROUGH CIRCUIT

Charles E. Smith, Wauwatosa; Karl M. Hink, Hartland, both of Wis.; Donald J. Greening, deceased, late of Mequon, Wis., and by Dorothy Greening, executrix, Mequon, Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed June 27, 1973, Ser. No. 373,989
Int. Cl. H02p *7/30*
U.S. Cl. 318—271 **6 Claims**



1. In a D.C. motor control system, the combination with means for adjustably supplying energy to a motor armature, of control means for supplying the first mentioned means with a control voltage which is variable as a function of a speed reference voltage, a speed error feed back voltage and a current error feed back voltage, and comprising:

a. speed reference means including means for presetting a desired magnitude of speed reference voltage and means holding change of such voltage to a predetermined timed rate following changes in adjustment of said presetting means,

b. current limit clamp means responsive to an input signal, which is a function of said speed error feed back and said speed reference voltages, rising to or exceeding a preset value to clamp said control voltage to a value holding the motor armature current to a corresponding limited value, and

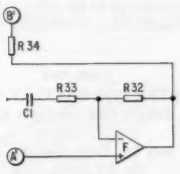
c. timed reference rate of change clamp means in circuit with said current limit clamp means and with said means holding change of said speed reference voltage to predetermined timed rate following adjustment of said presetting means, and responsive to said control voltage being clamped to said value holding the armature current to a corresponding limited value to subject the last mentioned means to a voltage which causes the rate of change in the speed reference voltage to be clamped to a rate corresponding to the actual rate of change in motor speed if the latter voltage has not attained its preset magnitude.

3,900,782

SYSTEM FOR COMPENSATING FOR TEMPERATURE VARIATIONS IN A MAGNETIC DISC DRIVE

Peter Hammerschmitt, Anaheim, Calif., assignor to BASF Aktiengesellschaft', Ludwigshafen (Rhine), Germany

Filed July 18, 1974, Ser. No. 489,692
Int. Cl. G05d *23/275*
U.S. Cl. 318—634 **4 Claims**



1. In a disc drive system of the type having a movable head which is servoed to the desired track in accordance with a scale located in an evironment which is likely to have a different temperature T_1 than the temperature T_2 of the disc and head arm, and comprising means for generating a first voltage proportional to the track position and the temperature differential between T_1 and T_2; means for generating a second voltage proportional to track position and the temperature differential between T_1 and a reference temperature T_3; and means for summing said first and second voltages together to provide a correcting signal to said servo whereby said head may be accurately positioned to the desired track irrespective of overall temperature variations or differences in the temperatures T_1 and T_2, the improvement which comprises means for generating a third voltage proportional to the temperature gradient between the temperatures T_2 and T_1 and means for feeding the third voltage as an additional control voltage to said servo.

3,900,783

BATTERY CHARGING CIRCUIT

Rollie R. Herzog, Burnt Hills, N.Y., and Robert P. Alley, Danville, Ill., assignors to General Electric Company, Indianapolis, Ind.

Filed Apr. 8, 1974, Ser. No. 458,861
Int. Cl.[2] H02J *7/00*
U.S. Cl. 320—2 **10 Claims**

1. A battery charging circuit comprising:

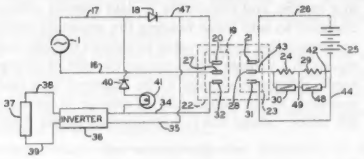
first and second leads for connection to an A.C. source;

a first rectifier connected to said first lead and arranged for connection to one side of the battery for providing unidirectional charging current for the battery;

said second lead arranged for connection to the other side of the battery;

third and fourth leads for connection to a load;

a two-part, selectively-severable junction device having a first section and a second section; said first section including first, second and third connectors, said first rectifier and said third lead connected to said first connector, said second lead connected to said second connector, said fourth lead connected to said third connector;



said second section being connected to the battery and having fourth, fifth and sixth connectors for mating respectively with the first, second and third connectors; said fourth connector connected to the one side of the battery, said fifth and sixth connectors connected to the other side of the battery;

indication means and a second rectifier connected in a series circuit relationship; between said fourth lead and said first lead, said indication means providing an indication when one of said second and fourth leads is not electrically connected to the other side of the battery and providing an indication of charging of the battery.

3,900,784

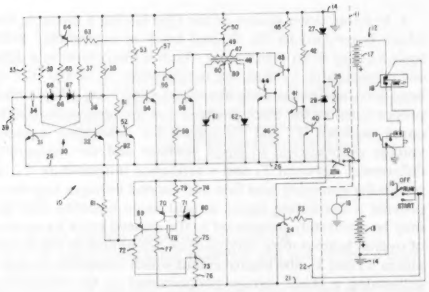
CONVERTER FOR BATTERY CHARGER

Helmut K. Seike, Toledo, Ohio, assignor to Eltra Corporation, Toledo, Ohio

Filed July 10, 1974, Ser. No. 487,011

Int. Cl. H02j *7/14*

U.S. Cl. 320—6 **11 Claims**



1. A converter for charging a battery from a direct current source comprising, in combination, a free running multivibrator having first and second periodic outputs, a transformer having primary and secondary windings, said primary winding having first and second winding portions, means for applying current from the source to said first primary portion during the first output from said multivibrator, means for applying current from the source to said second primary portion during the second output from said multivibrator, means for rectifying the output from said secondary winding to obtain a direct current for charging the battery, and means for increasing the operating frequency of said multivibrator as the output power from said transformer increases above a predetermined level.

8. In a vehicle including a main battery for operating an electrical system within the vehicle, a charger for the main battery operated from the vehicle's engine and an auxiliary battery connected in series with the main battery for supplying a high voltage for starting the engine, a converter for charging the auxiliary battery comprising, in combination, a free running multivibrator having first and second periodic outputs, a transformer having primary and secondary windings, said primary winding having first and second winding portions, means for applying current from the main battery and charger to said first primary portion during the first output from said multivibrator, means for applying current from the main battery and charger to said second primary portion during the second output from said multivibrator, means for rectifying the output from said secondary winding to obtain a direct current for charging the auxiliary battery, and means for increasing the operating frequency of said multivibrator as the power from said transformer increases above a predetermined level.

8. In a vehicle including a main battery for operating an electrical system within the vehicle, a charger for the main battery operated from the vehicle's engine and an auxiliary battery connected in series with the main battery for supplying a high voltage for starting the engine, a converter for charging the auxiliary battery comprising, in combination, a free running multivibrator having first and second periodic outputs, a transformer having primary and secondary windings, said primary winding having first and second winding portions, means for applying current from the main battery and charger to said first primary portion during the first output from said multivibrator, means for applying current from the main bettery and charger to said second primary portion during the second output from said multivibrator, means for rectifying the output from said secondary winding to obtain a direct current for charging the auxiliary battery, and means for increasing the operating frequency of said multivibrator as the power from said transformer increases above a predetermined level.

3,900,785

DEVICE FOR MONITORING THE CHARGING CURRENT FOR A STORAGE BATTERY OF ACCUMULATORS

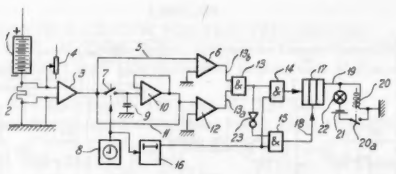
Andre Alric; Xavier Carlet; Robert Nozeran, and Pierre Gentet, all of Haute Garonne, France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Apr. 9, 1974, Ser. No. 459,335

Claims priority, application France, Apr. 17, 1973, 73.13846

Int. Cl.[2] H02J *7/00;* **H02H** *3/08*

U.S. Cl. 320—39 **17 Claims**

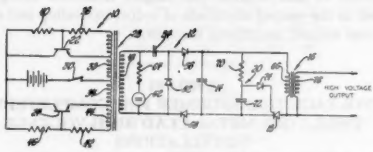


1. Device for monitoring the charging current for a storage battery of accumulators, specially for releasing an alarm if the charging current continuously increased during a predetermined time, said device comprising means for deriving an electric voltage proportional to the charging current, a memory system, timer means for generating recurrent timing signals, switching means operatable by each one of said timing signals for storing the instantaneous value of said electric voltage in said memory system, means for comparing the previously stored value of said electric voltage with its actual value, a pulse counter having a counting input, a reset input and an output, means for generating, at a time just preceding the timing signal which follows next said one timing signal, a first or a second pulse according to whether said actual value is superior or inferior to said stored value, means for transmitting said first or second pulse to said counting input or to said reset input of the counter, respectively, and an alarm device connected to the output of said counter.

3,900,786
HIGH VOLTAGE PULSE GENERATING CIRCUIT

Richard James Jordan, Roseville, Mich., assignor to General Marine, Inc., Bloomfield Hills, Mich.

Continuation of Ser. No. 284,309, Aug. 28, 1972. This application Dec. 21, 1973, Ser. No. 463,001
Int. Cl. H02m 3/22
U.S. Cl. 321—2 11 Claims

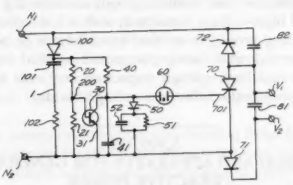


1. A high voltage pulse generating circuit comprising an alternating voltage source, a charging circuit including a coupling capacitor, a rectifier and a storage capacitor connected in series across said source, a thyristor including an anode, a cathode and a gate, a discharging circuit including the anode and cathode of the thyristor, and an induction coil connected in series across said storage capacitor, and control means connected with the gate of said thyristor for turning on the thyristor at controlled switching intervals to discharge the storage capacitor through said induction coil, the frequency of said source being high enough in relation to said controlled switching intervals so that there is at least one charging cycle for each switching interval whereby there is at least one discharging cycle during each switching interval, said coupling capacitor being the sole charging path for said storage capacitor whereby the current drawn from said source during the discharge cycle is limited by the impedance of said coupling capacitor.

3,900,787
ADAPTER FOR AUTOMATICALLY ADAPTING DC EQUIPMENT FOR ENERGIZATION BY A FIRST OR SECOND AC VOLTAGE OF DIFFERENT AMPLITUDES

Manfred Köster, Kronberg, Taunus, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 21, 1974, Ser. No. 453,372
Claims priority, application Germany, Mar. 22, 1973, 2314220; Sept. 17, 1973, 2346775
Int. Cl.[2] H02M 7/19
U.S. Cl. 321—15 19 Claims

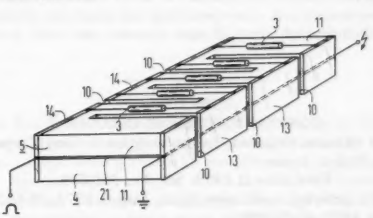


8. A system for automatically adapting equipment requiring a determined DC operating voltage for energization by a first or second AC voltage, said second AC voltage having substantially twice the amplitude of said first AC voltage, said system having a first and second input terminal for receiving said AC voltage and a first and second output terminal for furnishing said DC voltage, comprising, in combination, output rectifier means for rectifying the applied AC voltage and furnishing a corresponding DC voltage, said DC voltage constituting said operating voltage when said AC voltage is said second AC voltage, said output rectifier means comprising a first and second halfwave rectifier circuit connected to form a fullwave rectifier circuit, said first half-wave rectifier circuit comprising a first and second diode having, respectively, a cathode and an anode connected to said first and second input terminal, said second halfwave rectifier circuit comprising a first and second diode having, respectively, an anode and a cathode connected to said first and second input terminal; voltage doubler circuit means for doubling said corresponding DC voltage when connected to said output rectifier means, said voltage doubler circuit means comprising a first and second voltage doubler capacitor connected, respectively, in parallel with said first diode of said first halfwave rectifier circuit and said second diode of said second halfwave rectifier circuit; and voltage responsive means responsive to said applied AC voltage for connecting said voltage doubler circuit means to said rectifier means when said AC voltage is said first AC voltage and for disconnecting said voltage double circuit means from said rectifier means when said AC voltage is said second AC voltage, said voltage responsive means comprising means for connecting said first and second voltage doubler element to said first and second half-wave rectifier circuit respectively when said AC voltage energizing said equipment is said first AC voltage.

3,900,788
VOLTAGE MULTIPLIER

Reinhard Behn, and Gerhard Hoyler, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 21, 1974, Ser. No. 453,426
Claims priority, application Germany, Mar. 23, 1973, 2314674
Int. Cl. H01g 3/07; H02m 7/24
U.S. Cl. 321—15 12 Claims



1. A voltage multiplier having two rows of serially connected capacitors and terminals between capacitors on each row, a diode connecting each capacitor terminal on one row with a capacitor terminal on another row, all of said diodes being connected in series to pass pulses of one polarity only, said diodes being arranged to charge each capacitor, said two rows of serially connected capacitors consisting of end contacted layer capacitors which are integrally joined to one another, said end contacted layer capacitors being split into individual capacitors by slots which extend from one end face of the capacitor through the capacitive zone thereof to a point short of the opposite end face, the individual capacitors having unslotted portions of the metal coatings which serially connect each other, all of the terminals of a row of serially connected capacitors being formed in an end face, whereby said diodes may be readily connected from the terminals on the end face of one row of capacitors to the terminals on the end face of the other row of capacitors.

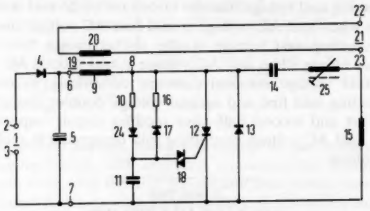
3,900,789
THYRISTOR SWITCHING POWER CIRCUIT

Michael Koubek, Ortlindestrasse 2, 8000 Munich 81, Germany

Filed June 4, 1973, Ser. No. 366,502
Claims priority, application Germany, June 12, 1972, 2228542
Int. Cl. H02m 7/00
U.S. Cl. 321—47 5 Claims

1. A thyristor switching power unit comprising two a.c. input terminals, a rectifier stage including a first diode and a first capacitor connected across said a.c. input terminals, a

pair of terminals in said rectifier stage at opposite ends of said capacitor through which a d.c. voltage may be taken off, one of said a.c. input terminals and one of said d.c. supply terminals being connected together and to a reference potential, a first coil connected between the other of said d.c. supply terminals and a first circuit point, said first circuit point and said reference potential having therebetween four parallel connections, the first comprising the series connection of a first resistor and a second capacitor, the second comprising a thyristor, the third comprising a second diode which lies in an anti-parallel line direction to said thyristor and the fourth



comprising the series connection of a third capacitor and a second coil, there also being a series connected second resistor and third diode connected between said first circuit point and a second circuit point in the circuit between said first resistor and said second capacitor, a diac, said diac being connected between said second circuit point and the ignition electrode of said thyristor, in which said fourth one of said parallel connections also includes in series with said capacitor and said second coil, a compensating coil means for adjusting the switch-through time of said thyristor and said second diode.

3,900,790

CONSTANT CURRENT CIRCUIT

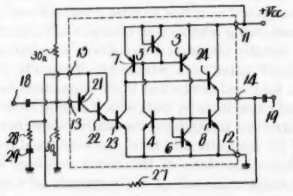
Mitsuo Ohsawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed June 1, 1973, Ser. No. 365,849

Claims priority, application Japan, June 6, 1972, 47-56349; June 6, 1972, 47-56350

Int. Cl.[2] G05F *1/56;* **H03F** *3/213*

U.S. Cl. 323—4 **3 Claims**



1. In combination an amplifier circuit having a constant current circuit as a load therefor, comprising: a first amplifying transistor having an input electrode supplied with a signal to be amplified and an output electrode, the first amplifying transistor being connected in a grounded emitter type configuration; a second amplifying transistor having an output electrode and an input electrode connected to the output electrode of the first amplifying transistor, the second amplifying transistor being connected in a grounded collector type configuration; a voltage source having at least two output terminals; first and second transistors, the base and collector electrodes of the first transistor being respectively connected to the collector and base electrodes of the second transistor, the respective emitter electrodes of the first and second transistors being connected to separate terminals of the voltage source; third and fourth unidirectional conducting devices for providing biasing voltages between the base and emitter electrodes of each of the first and second transistors; at least one further transistor, the base and emitter electrodes of said at least one further transistor being connected to the base and emitter electrodes of a corresponding one of the first and second transistors; whereby the collector current of said at least one further transistor with respect to the voltage source is utilizable as a constant current source; and the collector electrode of said at least one further transistor being connected to the output electrode of a corresponding one of the first and second amplifying transistors.

3,900,791

VOLTAGE TRANSFORMER FOR COMPLETELY INSULATED, METAL-CLAD HIGH-VOLTAGE INSTALLATIONS

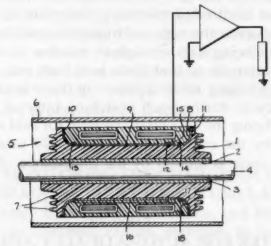
Gerhard Kleen, and Albert Herrmann, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 17, 1974, Ser. No. 471,014

Claims priority, application Germany, May 17, 1973, 2325448

Int. Cl. H01f *27/00;* **H01b** *9/00*

U.S. Cl. 323—93 **10 Claims**



1. A voltage transformer for a fully-insulated, metal-encapsulated, high-voltage installation such as a switching installation or the like having a metal outer tube containing a high-voltage conductor therein comprising: an extended-surface area electrode disposed in spaced relation to the high-voltage conductor; an insulating body for carrying said electrode in spaced relation to the high-voltage conductor, said electrode and the high-voltage conductor conjointly defining a high-voltage capacitor, said insulating body constituting the dielectric of said high-voltage capacitor; and, a low-voltage capacitor also being arranged on said insulating body so as to be carried thereby and being connected to said high-voltage capacitor, said high-voltage capacitor and said low-voltage capacitor conjointly defining a voltage divider.

3,900,792

METHOD AND APPARATUS FOR GENERATING REACTIVE POWER

Gottfried Möltgen, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 3, 1974, Ser. No. 430,569

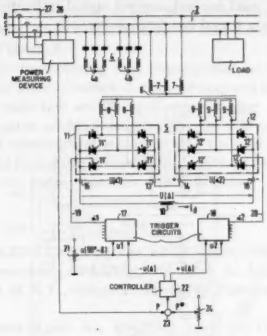
Claims priority, application Germany, Jan. 5, 1973, 2300445

Int. Cl. H02j *3/18*

U.S. Cl. 323—102 **11 Claims**

1. A method for the operation of an arrangment for generating reactive power, which arrangment includes a capacitor installation and two controlled converters, each connected to an A-C system having at least one phase, with the two controlled converters connected to each other on the D-C side through a smoothing choke and wherein the converters are controlled in a control range with control angles which differ

from each other, except for a common control range limit comprising the steps of controlling the control angles of the



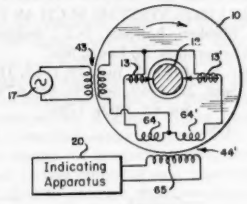
two converters such that their sum is always smaller than 180 by a predetermined angular amount.

3,900,793

EDDY CURRENT TESTING APPARATUS INCLUDING A ROTATING HEAD WITH PROBE AND NULL CIRCUIT MEANS MOUNTED THEREON INCLUDING ROTARY TRANSFORMER WINDINGS

Sven E. Mansson, Hollviksnas, Sweden, assignor to Magnetic Analysis Corporation, Mount Vernon, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,116
Int. Cl. G01r *33/12*
U.S. Cl. 324—40 **6 Claims**



1. Eddy current testing apparatus for the nondestructive testing of objects which comprises

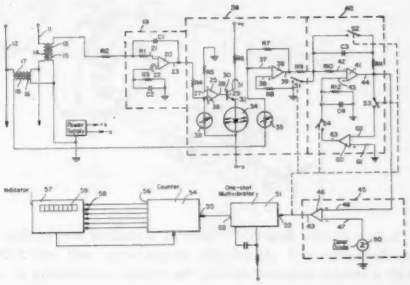
a. a rotating head through which an object is fed,
b. a source of alternating or pulsed current,
c. a first rotary transformer having a stationary winding supplied from said source and a winding on said rotating head,
d. probe means mounted on said rotating head for inducing eddy currents in said object when energized with alternating or pulsed current and responding to variations in the eddy currents in the presence of defects or flaws in the object,
e. a second rotary transformer having a stationary winding and a pair of windings on said rotating head,
f. null circuit means mounted on said rotating head and including said probe means and said pair of windings of the second rotary transformer for receiving alternating or pulsed current from said first rotary transformer and producing in the stationary winding of the second rotary transformer a null signal output in the absence of defects or flaws in a said object and output signals varying from said null in the presence of defects or flaws,
g. and quadrature-detecting indicating means supplied with the output signals in the stationary winding of said second rotary transformer for indicating defects or flaws in said object.

3,900,794

ELECTRONIC POWER METERING DEVICE

Gregory R. Bell, 1504 Prospect Ave., Redondo, Calif. 90254

Filed Feb. 25, 1974, Ser. No. 445,143
Int. Cl.² G01R *7/00, 11/32*
U.S. Cl. 324—142 **9 Claims**



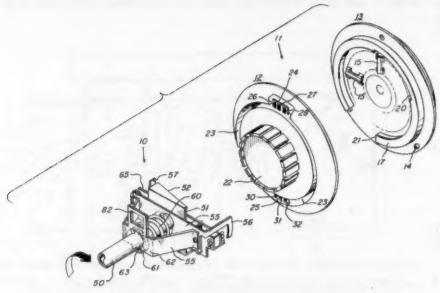
1. In a device for measuring the power used by an electrical system, a power to frequency converter, comprising:

a. voltage sensing means for sampling the instanteous voltage electrically coupled across the electrical system, said voltage sensing means having a voltage output that is proportional to and in phase with the instanteous voltage;
b. current sensing means for measuring the instanteous current electrically coupled in series with the electrical system, said current sensing means having a voltage output that is proportional to and in phase with the instanteous current;
c. electronic multiplication means for electronically multiplying the voltage outputs of said voltage sensing means and said current sensing means, said electronic multiplication means being electrically coupled to said voltage sensing means and said current sensing means and having a voltage output that is proportional to and in phase with the instanteous power;
d. integrating means for accumulating the voltage output of said electronic multiplication means, electrically coupled to said electronic multiplication means, said integrating means having a voltage output that is proportional to the amount of power used by the electrical system over a period of time;
e. reference means for providing a reference voltage;
f. comparator means for comparing the voltage output of said integrator means to the reference voltage, electrically coupled to said integrating means and to said reference means, said comparator means also providing a voltage signal when the output voltage of said integrating means reaches or exceeds the reference voltage; and
g. nulling means for nulling the voltage output of said integrating means to zero volts when the voltage signal is received from said comparator means, electrically coupled to said comparator means and to said integrating means.

3,900,795
INSTALLATION AND TEST TOOL FOR IONIZATION SMOKE DETECTOR

Larry D. Larsen, Palatine; Lee Schuck, Buffalo Grove; Joseph C. Pekarek, Mt. Prospect, and Richard C. Mott, Harwood Heights, all of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 15, 1973, Ser. No. 388,520
Int. Cl. G01n *23/12;* **B25b** *27/00*
U.S. Cl. 324—158 R **12 Claims**



1. In a smoke detector system an installing and testing tool mechanically and electrically cooperating and interlocking with a smoke detector device, the system comprising in combination:

a smoke detector device having a permanently mounted overhead fixture portion with a plurality of electrical contacts which are adapted to be wired to a central station, and said device having a detachably mounted smoke sensor portion adapted for mounting to said fixture portion, said smoke sensor portion including a plurality of electrical contacts positioned to match with the contacts of the fixture portion,

said smoke sensor portion having a pair of tabs with electrical test terminals thereon, said tabs being adapted to engage and be grasped by an installing and testing tool;

an installing and testing tool for said smoke sensor portion, said tool having tab engaging and grasping means, said last named means including test probe finger means positioned to make contact with said electrical test terminals on said tabs when said tabs are engaged and grasped by said tool, and

said tool having extended handle means which is rotationally operative to cause said tab engaging and grasping means to grasp and release said tabs.

3,900,796
ROTATIONAL SPEED MONITOR

Andrew M. Rose, Santa Clara, Calif., assignor to Sperry Rand Corporation, Blue Bell, Pa.

Filed Mar. 7, 1974, Ser. No. 449,165
Int. Cl.[2] G01P *3/56*
U.S. Cl. 324—161 **7 Claims**

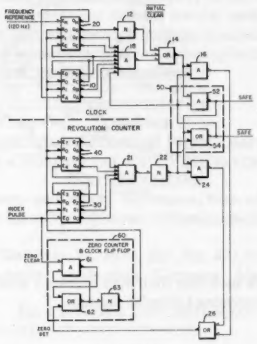
1. The method of monitoring the speed of a rotating member including the steps of

a. sampling the number of revolutions of said rotating member within a first designated time period;

b. sampling the number of cycles produced by an accurate frequency source with a second designated time period which is longer than said first time period, the cycles of said frequency source and the revolutions of said rotating member being asynchronous with respect to one another;

c. generating a first control signal based on said first mentioned sampling when the number of preselected revolutions is not counted within said second designated time period, said first control signal causing a resampling of said number of revolutions and cycles;

d. generating a second control signal based on said second mentioned sampling when the number of preselected revolutions is counted within said second designated time period, said second control signal indicating that a safe operating speed has been achieved;

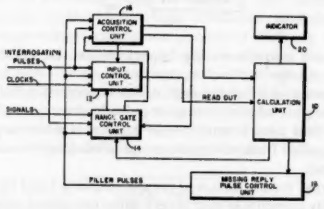


e. providing a third designated time period which is longer than second time period, whereby when said number of preselected revolutions is counted within said second designated time period, the number of preselected revolutions is thereafter counted within said third designated time period.

3,900,797
DIGITAL RANGE COMPUTER SYSTEMS FOR AIR NAVIGATION SYSTEMS SUCH AS TACAN

Frederick J. Mimken, Fairport, N.Y., assignor to General Dynamics Corporation, St. Louis, Mo.

Division of Ser. No. 467,897, June 29, 1965. This application Sept. 22, 1969, Ser. No. 859,679
Int. Cl. H03k *17/00*
U.S. Cl. 328—129 **5 Claims**



1. A time error detector for providing an output corresponding to the time interval between a first and a second pulse which occur in close time relationship with each other, said detector comprising

a. means responsive to said first and said second pulses for respectively producing a third pulse if, and only if, said first pulse occurs before said second pulse and a fourth pulse if, and only if, said second pulse occurs before said first pulse, said third and fourth pulses having durations corresponding to the time interval between said first and second pulses,

b. a memory element responsive to said third and fourth pulses which provide storage which represents the occurrence thereof,

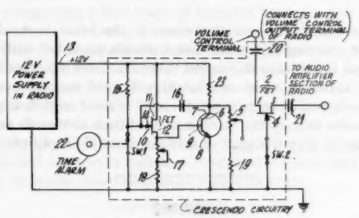
c. a counter,
d. a source of clock pulses of frequency higher than the individual frequency of said first and second pulses,
e. gate means responsive to said third and fourth pulses for transmitting said clock pulses to said counter for the duration thereof,
f. means for transmitting said clock pulses to said counter for a time interval which occurs subsequent to the occurrence of said first and second pulses, and
g. output gates enabled respectively by said memory element for transmitting output of said counter respectively when said first pulse precedes said second pulse and when said second pulse precedes said first pulse.

3,900,798

RADIO SOLID STATE CRESCENDO VOLUME ALARM

Alfred S. Pomerantz, Brooklyn, and Imre A. Andrassy, New York, both of N.Y., assignors to Alfred Pomerantz, Brooklyn, N.Y.

Continuation of Ser. No. 134,950, April 19, 1971. This application June 25, 1973, Ser. No. 373,035
Int. Cl. H04b *1/32*
U.S. Cl. 325—396 **8 Claims**


12V POWER SUPPLY IN RADIO
VOLUME CONTROL TERMINAL
CONNECTS WITH VOLUME CONTROL OUTPUT TERMINAL OF RADIO
TO AUDIO AMPLIFIER SECTION OF RADIO
TIME ALARM
CRESCENDO CIRCUITRY

1. An electronic crescendo system for changing the magnitude of an audio signal over a period of time to achieve a crescendo effect, said system comprising adjustable means for setting the maximum signal level to be produced, controlled means having an input and output, said input being connected to said adjustable means, amplifier means connected to the output of said controlled means, control means connected to said controlled means for gradually varying the level of the signal produced at said output of said controlled means for said period of time to produce an increasing audio level to achieve said crescendo effect, and time responsive means including switch means activated by said time responsive means for actuating said control means and said controlled means.

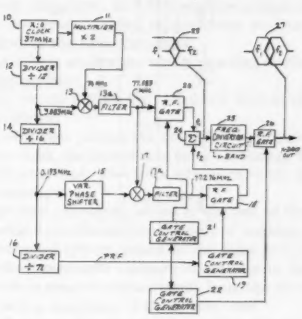
3,900,799

SPLIT PULSE GENERATOR

Donald J. Hoft, Holliston, and Philip R. Shutt, Harvard, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 9, 1974, Ser. No. 468,327
Int. Cl.[2] H03K *5/00, 5/156, 5/20*
U.S. Cl. 328—28 **2 Claims**

1. A split pulse generator comprised of a common clock generating a first signal of a first predetermined frequency, means to multiply said first signal to obtain a second signal of a second predetermined frequency, first means to divide said first signal to obtain a third signal of a third predetermined frequency, first means to mix said second signal and said third signal to obtain a fourth signal having a fourth predetermined frequency, second means to divide said third signal to obtain a fifth signal having a fifth predetermined frequency, means to selectively phase shift said fifth signal, second means to mix said fourth signal and the phase shifted signal to obtain a sixth signal having a predetermined frequency, the frequency of said fourth signal differing from the frequency of said sixth signal by a predetermined magnitude, third means to divide said fifth signal by a preselected number to obtain a seventh signal of a preselected pulse repetition frequency, first and second normally closed RF gates receiving said fourth and sixth signals, respectively, first and second gate control pulse generators, each receiving said seventh signal for triggering purposes and in response thereto providing first and second control pulses of predetermined width to said first and second



RF gates, respectively, for opening thereof, said first control pulse having a trailing edge substantially coinciding with the leading edge of said second control pulse, means to sum the output signals from said first and second RF gates, means to frequency convert the summed signal to X-band, a third gate control pulse generator also triggered by said seventh signal and providing a pulse therefrom at a predetermined time and at a predetermined width, and operating to provide an output X-band pulse having a first half-pulse frequency and a second half-pulse frequency.

3,900,800

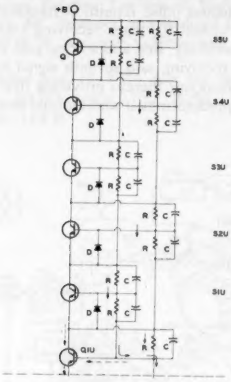
HIGH VOLTAGE AMPLIFIER

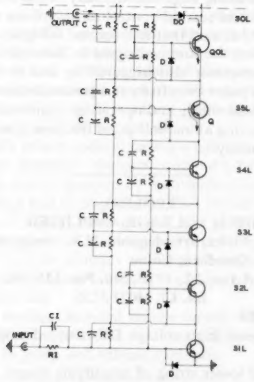
Martin Sidney Maltz, Irondequoit, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 22, 1973, Ser. No. 325,766
Int. Cl. H03f *3/26*
U.S. Cl. 330—15 **3 Claims**

1. A high speed, high voltage DC coupled amplifier comprising,
an upper and lower string of amplifying stages, said upper string of amplifying stages connected in series with a bias circuit for said lower string of amplifying stages and said lower string of amplifying stages connected in series with a bias circuit for said upper string of amplifying stages, wherein each of said amplifying stages includes an active element having first, second and third electrodes,
first diode means connecting the third electrode of the active element of the first stage of the upper string to the first electrode of the active element of the last stage of the lower string, said diode means being so poled that it conducts and drives the output in one direction and turns off the upper string when the lower string turns on and that it turns said upper string on which drives the output in the other direction when said lower string is turned off, thereby enabling the upper and lower strings to operate in a push-pull relationship,
first impedance means coupled between adjacent amplifying stages for establishing substantially equal potential across the first and second electrodes of the adjacent stages,
second impedance means coupled in shunt with said first impedance means for enhancing the response speed of

the amplifier, and





reverse voltage preventing means coupled across said second and third electrode of said active element for preventing an application of a large reverse potential thereto.

3,900,801

GAIN CONTROLLED DIFFERENTIAL AMPLIFIER

Hiroshi Furuno, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 29, 1974, Ser. No. 492,837

Claims priority, application Japan, Aug. 8, 1973, 48-93337[U]

Int. Cl.[2] H03G *3/30*

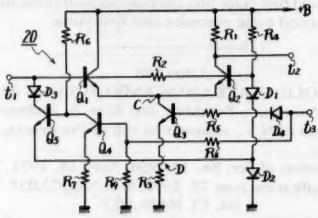
U.S. Cl. 330—29 **9 Claims**

1. A differential amplifier, comprising:

first and second amplifying transistor means connected in differential amplifier configuration and having respective emitter electrodes connected in common, one of said first and second amplifying transistor means being provided with a signal input terminal and the other of said first and second amplifying transistor means being provided with a signal output terminal;

a control input terminal for receiving a control signal;

first control means connected to said common connected emitter electrodes and coupled to said control input terminal for receiving said control signal, said first control means being responsive to said control signal applied thereto for varying the currents flowing through said first and second amplifying transistor means; and



second control means connected to the base electrode of said one amplifying transistor means provided with said input terminal and coupled to said control input terminal for receiving said control signal, said second control means being responsive to said control signal applied thereto to vary the voltage at said base electrode and to thereby vary the gain of said differential amplifier.

3,900,802

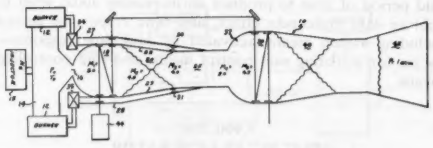
TWO STAGE GAS DYNAMIC LASER

Robert W. Milling, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 8, 1973, Ser. No. 369,031

Int. Cl. H01s *3/08*

U.S. Cl. 331—94.5 G **3 Claims**

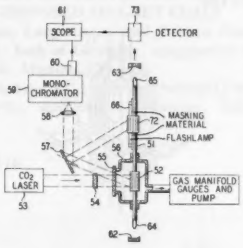


1. A two stage gas dynamic laser comprising: a plenum chamber means for supplying a high temperature, high pressure gas dynamic lasing medium to said plenum chamber; means for rapidly expanding said lasing medium to provide a population inversion in a first optical cavity; means for providing a first set of oblique shock waves in the gas flow path in the output of the first optical cavity to slightly compress the gas; means for adding heat to the gas after the slight compression to obtain a major compression of the gas; means for rapidly expanding the gas to provide a population inversion in a second optical cavity; means for providing a second set of oblique shock waves in the gas flow path in the output of the second optical cavity to decelerate the flow; a subsonic diffuser in the output of the oblique shock producing means and means for extracting laser energy from said first optical cavity and said second optical cavity.

3,900,803
LASERS OPTICALLY PUMPED BY LASER-PRODUCED PLASMA

William Thomas Silfvast, and Obert Reeves Wood II, both of Holmdel Twp., Monmouth County, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 24, 1974, Ser. No. 463,616
Int. Cl.[2] H01S 3/09
U.S. Cl. 331—94.5 P 5 Claims

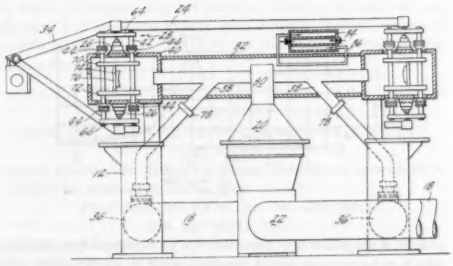


1. Apparatus for the stimulated emission of coherent radiation, comprising a first body of material having a pair of optically connected energy levels between which a population inversion can be established, and means for optically pumping said body to establish said population inversion including means for supplying a quantity of a second material about said body, and laser means for creating a plasma in said quantity of said second material in a generally cylindrical volume substantially paralleling the surface of said body to generate visible and ultraviolet radiation from said volume, said plasma being optically closely-coupled with said body.

3,900,804
MULTITUBE COAXIAL CLOSED CYCLE GAS LASER SYSTEM

Jack W. Davis, East Hartford, and Allan P. Walch, Manchester, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 26, 1973, Ser. No. 427,960
Int. Cl. H01s 3/22
U.S. Cl. 331—94.5 T 5 Claims



1. A closed cycle system for the production of laser radiation with a gaseous working medium which is circulated in a loop through the system comprising:

a convection laser having a gas inlet and a gas discharge and including:

an unstable resonator section formed between two curved reflecting surfaces which have a common optical axis about which is positioned a plurality of electric discharge tubes;

means for providing an electric discharge along the optical axis to produce laser radiation in the resonator;

a flat reflecting surface positioned on the axis to couple laser radiation from the resonator as an output beam having an annular cross section; and

means for cooling the laser reflecting surfaces;

an exhaust heat exchanger which provides cooling to the working medium;

first flow means joining the laser gas discharge to the exhaust heat exchanger;

a main circulator for maintaining continuous circulation of the working medium through the laser loop;

second flow means joining the exhaust heat exchanger to the main circulator, and second flow means including means for insulating the exhaust heat exchanger from vibrations in the main circulator;

a circulator heat exchanger which provides cooling to the working medium;

third flow means joining the circulator heat exchanger to the circulator;

fourth flow means joining the circulator heat exchanger to the laser inlet, the fourth flow means including means for insulating the laser inlet from vibrations in the circulator heat exchanger;

a makeup feed gas supply joined to the one of flow means to provide a continuous fresh supply of working medium;

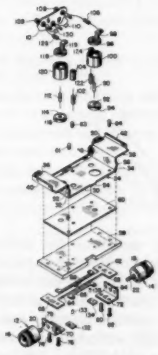
a gas removal system joined to the third flow means to maintain steady state pressure conditions in the system loop and to remove contaminants from the working medium during operation of the system; and

a standoff device fixedly interconnecting the second and fourth flow means for avoiding the imposition of side loadings on the laser as a result of pressure differentials inside and outside of said flow means and for avoiding loading at least part of the flow means with twisting moments.

3,900,805
DIRECTIONAL COUPLER FOR TRANSMISSION LINES

Harold E. Stevens, Lyndhurst, Ohio, assignor to Coaxial Dynamics, Cleveland, Ohio

Division of Ser. No. 192,529, Oct. 26, 1971, Pat. No. 3,829,770. This application Mar. 22, 1974, Ser. No. 453,786
Int. Cl.[2] H01P 5/18
U.S. Cl. 333—10 11 Claims



1. A directional coupler for detecting and measuring unidirectional flow of power in a transmission line comprising

an electrically conductive elongated housing having transmission line input and output connectors mounted thereon,

an electrically conductive partition member positioned within and engaging said housing to define a first and a second chamber for substantially preventing the passage

of electrical fields from said first chamber to said second chamber,

an insulative board having first and second oppositely facing surfaces,

a first electrically conductive film layer secured to said first surface of said insulative board, said board secured to at least a portion of said partition member with said first film layer sandwiched therebetween,

a second electrically conductive film layer secured to at least a portion of said second surface of said insulative board thereby defining a predetermined impedance between said first and second film layers,

a third electrically conductive film layer and secured to at least a portion of said second surface of said board in spaced, mutual coupling with respect to said second film layer thereby defining a predetermined mutual impedance between said second and third film layers,

said transmission line input and output connectors respectively having one terminal coupled to said second film layer and its other terminal coupled to said partition member,

and a signal developing network mounted on the side of said partition member opposite said insulative board and coupled to said first and third film layers to develop an output signal representative of the unidirectional line voltage of the signal propagated along the transmission line for a given line characteristic impedance.

3,900,806

GROUP-DELAY EQUALIZER USING A MEANDER FOLDED TRANSMISSION LINE

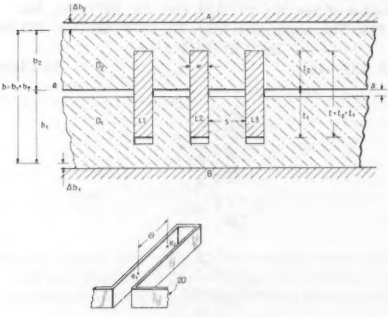
Ignazio Caroli, Rome, Italy, assignor to Seleniz-Industrie Elettroniche Associate S.p.A., Italy

Filed Apr. 4, 1974, Ser. No. 457,825

Claims priority, application Italy, Apr. 13, 1973, 49461/73

Int. Cl. H01p *9/00;* **H03h** *7/16*

U.S. Cl. 333—28 R **2 Claims**



1. A group-delay equalizer for microwave frequencies, comprising a meander folded transmission line, and adjusting means for changing separately the electric lengths of said folded transmission line associated to two different modes of propagation of the electromagnetic energy along said line, wherein said folded line is located between two ground planes, said adjusting means comprising a first block of substantially homogeneous dielectric material into which is immersed the aforesaid strip line partially folded lengthwise, a second block of dielectric material substantially similar to said first dielectric block of which it is possible to adjust the immersion of said line; means for changing the distance of one of said ground planes with respect to the outer surface of said first dielectric block, and means for changing the distance of the other of said ground planes to which is fixed said second dielectric block in order to change the immersion of said second dielectric block into said folded line.

3,900,807

MAGNETICALLY CONTROLLED SWITCHING DEVICE

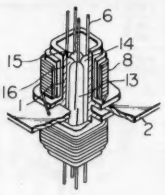
Michihiro Hamada, Yokohama; Youji Maeda, Sagamihara, and Shinichi Inoue, Yokohama, all of Japan, assignors to Fujitsu Ltd., Tokyo, Japan

Filed Oct. 23, 1973, Ser. No. 408,816

Claims priority, application Japan, Oct. 31, 1972, 47-125984[U]; Oct. 30, 1972, 47-109074; Oct. 31, 1972, 47-125985[U]

Int. Cl.[2] **H01H** *67/30*

U.S. Cl. 335—152 **3 Claims**



1. A magnetically controlled switching assembly comprising:

a. a plurality of reed switches having lead terminals which are bent;

b. a plurality of coil forms for containing said reed switches about which the driving coils of said reed switches are wound, said forms having unfilled apertures in the end portions thereof through which said bent lead terminals are passed; and

c. multiple vertical and horizontal conductors which are composed of magnetic material for connecting said leads at crosspoints of a matrix in row and column directions.

3,900,808

MAGNETIC LENS ASSEMBLIES FOR CORPUSCULAR RAY DEVICES WHICH OPERATE UNDER VACUUM

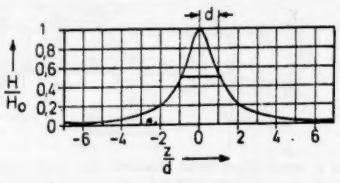
Helmut Zerbst; Reinhard Weyl, and Isolde Dietrich, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 26, 1967, Ser. No. 648,623

Claims priority, application Germany, Sept. 21, 1966, 5105968

Int. Cl. H01f *7/00*

U.S. Cl. 335—210 **12 Claims**



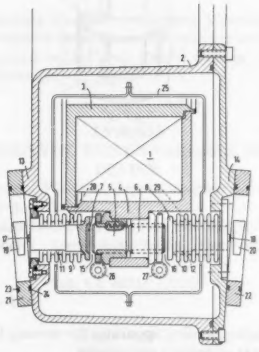
1. In a magnetic lens assembly for a corpuscular ray device which is to operate under vacuum, such as an objective lens assembly of an electron microscope, a pair of coaxial shielding cylinders spaced from each other and having a common axis coinciding with a lens axis of the assembly, said shielding cylinders being made of a superconductive material, a cryogenic refrigerating means thermally connected with said cylinders, lens winding means surrounding said cylinders for generating a magnetic field, said cylinders concentrating said field in the region of a corpuscular ray traveling along said lens axis and said shielding cylinders respectively terminating in a pair of end faces which are directed toward each other and which define between themselves a lens gap which is devoid of any

shielding components made of superconductive material, said gap having a magnitude which at a predetermined value of field intensity beyond said lens gap and said shielding cylinders provides a maximum value of field intensity in the lens gap and a field gradient in the lens gap along said lens axis resulting in an aperture error constant of the lens assembly which is less than a predetermined value.

3,900,809
ABSORPTION APPARATUS FOR ADJACENTLY DISPOSED MAGNET COILS

Dieter Kullmann, Langenzenn, and Helmut Marsing, Neunkirchen A. B., both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 27, 1974, Ser. No. 483,525
Claims priority, application Germany, July 5, 1973, 2334251
Int. Cl. H01f *7/22*
U.S. Cl. 335—216 **11 Claims**

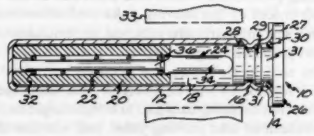


1. In a force absorption apparatus for a plurality of adjacently disposed magnet coils between which forces interact, each of said coils being disposed in a low-temperature coolant tank which is surrounded by a vacuum housing at normal temperature, means for providing a force-transmitting coupling between adjacent ones of said coolant tanks, comprising: at least one first support member, coupled to said coolant tank, movable axially along the longitudinal axis thereof; and at least one second support member, coupled to said vacuum housing and movable axially with respect thereto, disposed axially adjacent said first support member for engagement therewith.

3,900,810
TIME DELAY CAPSULE FOR MAGNETIC CIRCUIT BREAKER

Aime J. Grenier, N. Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 26, 1974, Ser. No. 483,466
Int. Cl.² H01F *7/18*
U.S. Cl. 335—239 **6 Claims**

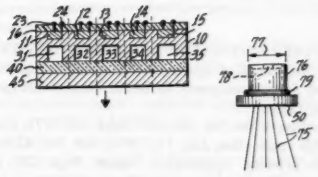


1. An improved time delay capsule for a magnetic circuit breaker or the like comprising a tube having an open end and a closed end, a magnetic core having an axial bore with a reduced diameter portion forming a shoulder within the bore adjacent one end of the core, the magnetic core being slidably disposed in the tube with said one end of the core at the closed end of the tube, a liquid of selected viscosity disposed in the tube, a coil spring disposed within the axial bore in the core and having one spring end engaging said shoulder, a stem having a reduced diameter portion fitted within the coil spring and having a head portion slidable in the bore in the magnetic core and engaging the opposite end of the coil spring, a cap fitted into the open end of the tube to engage the head portion of the stem, and means spaced from the coil spring sealing the cap to the tube.

3,900,811
ECONOMICAL PRESSURE TRANSDUCER ASSEMBLIES, METHODS OF FABRICATING AND MOUNTING THE SAME

Anthony D. Kurtz, Englewood; Amnon Brosh, Demarest; Charles L. Gravel, River Edge, and Joseph R. Mallon, Alpine, all of N.J., assignors to Kolite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Dec. 11, 1973, Ser. No. 423,713
Int. Cl.² G01L *1/22*
U.S. Cl. 338—2 **14 Claims**



1. A pressure transducer assembly, comprising
a. a member of silicon having a top surface upon which is located at a relatively central area thereof at least one piezoresistive element responsive to an external force for varying its resistance accordingly, and a bottom surface having an aperture, said aperture being of a diameter to enclose said relatively central area on said top surface to thereby encircle said area of said top surface upon which said element is located,
b. a layer of glass secured to the bottom surface of said member to close said aperture,
c. a layer of silicon dioxide covering said top surface of said member to thereby cover said element for protecting the same against deleterious substances present in a force transmitting environment, and
d. a wafer of a semiconductor material secured to said layer of glass on the surface opposite to that secured to said member to serve as an attenuator for said transducer.

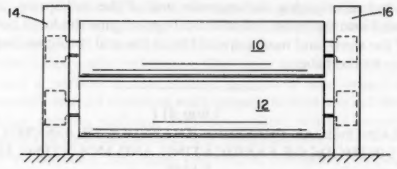
3,900,812
STRAIN GAGE TRANSDUCER

Given A. Brewer, Marion, Mass., assignor to Brewer Engineering Laboratories, Inc., Marion, Mass.

Filed Mar. 25, 1974, Ser. No. 454,460
Int. Cl. G01l *1/22*
U.S. Cl. 338—2 **3 Claims**

1. In combination with a bearing assembly having an outer non-rotatable element with a cylindrical outer surface positioned within a fixed bearing support having an inner surface spaced radially outwardly from said bearing non-rotatable element outer surface,
bearing mounting means for measuring bearing stresses, mounting said non-rotatable element within said bearing support, said non-rotatable element being supported externally solely by said bearing mounting means,

said bearing mounting means comprising
a plurality of pads positioned adjacent the inner surface of said bearing support and having inner faces positioned radially inwardly of said inner surface, and
a plurality of transducers mounted by said bearing support,, each said transducer comprising
a cup shaped support portion including an outer wall and a flat base closing one end of said outer wall,



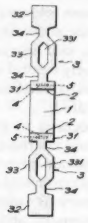
a columnar member secured to said base concentrically spaced within said outer wall and extending therebeyond, providing a contact end, and
at least one strain gage element secured to said columnar member between said base and said contact end,
the said contact end of a transducer being in contact with a said pad for transmission of forces from said pad to said transducer.

3,900,813

GALVANO-MAGNETO EFFECT DEVICE

Noboru Masuda, Kawaguchi, and Hisashi Takiguchi, Tokyo, both of Japan, assignors to Denki Onkyo Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 183,007, Sept. 23, 1971, abandoned. This application Jan. 11, 1974, Ser. No. 432,834
Claims priority, application Japan, Sept. 28, 1970, 45-84799
Int. Cl. H01c 7/16
U.S. Cl. 338—32 R **5 Claims**



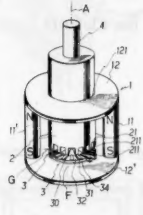
1. A galvano-magneto effect device comprised of:
a. a semiconductor element having terminal sections wherein electrodes are formed and coated with a thermally fusible conductive material at said terminal sections, and
b. a plurality of conductive lead frames each comprising two wide ends, one end formed as the coupling end connected to one of said electrodes, the other end formed as a connection terminal to be connected to a circuit, a wide reinforcing part and narrow neck portions coupling said reinforcing part between said coupling end and said connection terminal, wherein at least said coupling end is formed thinly and has a prior coating of a thermally fusible conductive material which is melted to join with the conductive material forming the electrodes of said semiconductor element, wherein when the lead frames and semiconductor elements are brought together and the conductive material of the coupling ends and that of the electrodes are bonded, the lead frames are thereby bonded to the electrodes.

3,900,814

REVOLUTION SENSING APPARATUS

Noboru Masuda, Kawaguchi, Japan, assignor to Denki Onkyo Company, Ltd., Tokyo, Japan

Filed May 31, 1973, Ser. No. 365,502
Int. Cl. H01c 7/16
U.S. Cl. 338—32 R **13 Claims**



1. A revolution sensing apparatus for sensing the rotation of a machine said apparatus comprising
a. a fixed yoke made of a magnetic material and having a flat part,
b. a moving yoke made of a magnetic material having an extreme end opposed to said flat part with a gap therebetween said moving yoke being adapted to be moved by the revolution torque of said machine in a direction along said flat part, said moving yoke having a plurality of projected segments facing said flat part of the fixed yoke the projected segments being arranged in a direction of movement of said moving yoke,
c. a magnetism generating means operatively connected to at least one of said yokes, and
d. at least one magneto-resistance effect device having two ends and having at least one magnetism sensing part positioned in said gap opposed to said projected segment said magneto-resistance effect device comprising a magnetism sensing semiconductor plate and at least one shorting segment made of a conductive material and arranged across said semiconductor plate in a direction intersecting the direction of movement of said moving yoke, whereby said magneto-resistance effect device includes a plurality of magnetism sensing parts which are formed with intervals therebetween said shorting segment being positioned within said intervals in the direction of movement of the moving yoke and wherein said magnetism sensing parts are adapted to simultaneously oppose said projected segments,
wherein said both yokes are arranged so that a magnetic circuit is formed by said magnetism generating means and the magnetic flux crossing said gap at a right angle to the direction of movement of said moving yoke, and wherein the magnetic flux concentrated by said projected segment is applied to said magnetism sensing parts in sequence as said moving yoke moves.

3,900,815

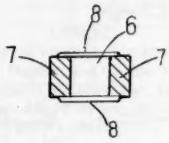
ELEMENT FOR DETECTION OF COMBUSTIBLE GASES AND SMOKE

Naoyoshi Taguchi, 1-2 Uemachi Ikeda Nagata-ku, Kobe, Japan

Continuation of Ser. No. 164,850, July 26, 1971, abandoned, which is a division of Ser. No. 800,798, Jan. 21, 1969, Pat. No. 3,625,756. This application Sept. 19, 1973, Ser. No. 398,710

Int. Cl. H01c *13/00*

U.S. Cl. 338—34 7 Claims



1. A gas sensing element comprising a porous body that includes a powdered tin oxide semiconductor and at least two electrodes secured to said body for the passage of an electric current therethrough.

3,900,816

ELECTROMAGNETIC DRIVEN VARIABLE RESISTANCE DEVICE

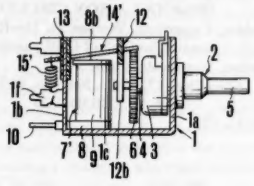
Tetsuhiro Kiyono, Wakuya, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1974, Ser. No. 518,950

Claims priority, application Japan, Oct. 30, 1973, 48-121980

Int. Cl. H01c *13/00*

U.S. Cl. 338—116 6 Claims



1. An electromagnetic driven variable resistance device comprising

a case having side walls,

a variable resistor provided with a rotating shaft and mounted onto one side-face of said case,

said shaft being rotatable to vary resistance value of said resistance device,

a drive-gear rotatably mounted on said rotating shaft,

a pair of electromagnetic solenoids mounted to said case and having electrical terminals,

a pair of movable driving-pawl members made of magnetic material each of which is pivotally mounted in relationship to said solenoid and positioned above said solenoids and able to engage a tooth of said drive-gear so as to rotate said drive-gear,

a stopper plate attached to said case for position-limitation of said pair of movable driving-pawl members, and

a spacer being attached to said case for pivotally supporting said pair of movable driving-pawl members,

said stopper plate and said spacer being made of non-metallic material.

3,900,817

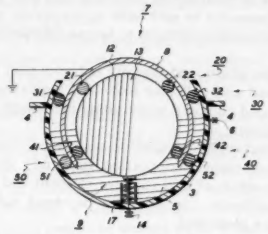
SPHERICAL POTENTIOMETER WITH BALL CONTACT MEANS

Vernon E. Punt, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 10, 1973, Ser. No. 423,633

Int. Cl. H01c *5/04*

U.S. Cl. 338—157 4 Claims



1. A potentiometer comprising:

a first hollow stationary sphere,

a first continuous convoluted strip of resistive material carried on the inner surface of said first sphere,

a first terminal means coupled to one end of said first strip of resistive material,

a stationary ball surface located within said first sphere,

a second continuous convoluted strip of resistive material carried by said ball surface,

a second terminal means coupled to one end of said second strip of resistive material,

a second hollow sphere, and

bearing means for mounting said second sphere for rotational movement intermediate said ball surface and said first sphere, said means including at least two conductive ball bearings, one in contact with said first strip and the other in contact with said second strip.

3,900,818

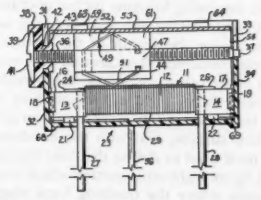
NON HERMETIC SEALED LINEAR TRIMMING POTENTIOMETER

Louis H. Berkelhamer, Glencoe, and William H. Schapira, Skokie, both of Ill., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 110,859, Jan. 29, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 427,623

Int. Cl. H01c *5/02*

U.S. Cl. 338—176 12 Claims

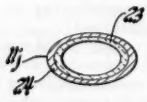


1. A potentiometer comprising:

A. An elongated resistive element including an elongated insulating member and a plurality of turns of resistance wire wound thereon, said insulating member having a central cylindrical portion which in turn has a substantially flat portion of the upper surface, said substantially flat portion including a central longitudinal ridge, said turns of resistance wire being tautly wound across said ridge.

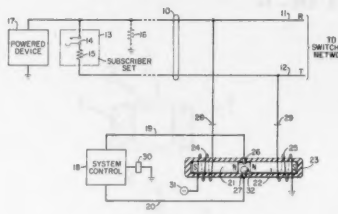
B. A shell in which said resistive element is fixedly located, said shell comprising:
1. a pair of side walls and a bottom wall substantially parallel to said resistive element, and
2. a pair of end walls joining the ends of the side walls and the bottom wall to form an open-topped shell surrounding said resistive element;
C. A conductive collector plate extending parallel to said resistive element across the top of said shell and mechanically connected to said walls to cooperate with said wall and said resistive element to form a substantially enclosed space;
D. A slider positioned directly between said resistive element and said collector plate and logitudinally movable within said enclosed space along the length of said resistive element;
E. A contact spring attached to said slide to move therewith and comprising one portion resiliently contacting the ridge position of said resistive element and another portion resiliently engaging the proximal surface of said collector plate and
F. Means to move the slider along its range of travel.

3,900,819
THERMAL DIRECTIONAL FLUID FLOW TRANSDUCER
Robert S. Djorup, Wellesley, Mass., assignor to Environmental Instruments, Inc., Natick, Mass.
Filed Feb. 7, 1973, Ser. No. 330,400
Int. Cl. H01c *15/00*
U.S. Cl. 338—320 **1 Claim**



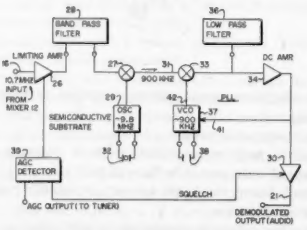
1. A directional fluid flow sensor comprising:
a. at least two similar thermally and physically separated resistive electrical conductors;
b. each of said conductors having a length at least equal to the largest cross section dimension of the conductor;
c. each of said electrical conductors including a hollow electrically non-conductive refractory cylindrical substrate supporting body extending the length of the conductor, and a conductive resistance film having a non-zero temperature coefficient adhered to the outer surface of the substrate body and extended over the length of the substrate body;
d. a thermo insulating bridging means operatively disposed between, and closing the gap between said electrical conductors over the length of the conductors, thereby preventing connected flow around one conductor independent of the other conductor, the overall shape of the sensor being figure eight in cross section, with the conductors being exposed to ventilation over at least a majority of their surface, and with the conductor pair cross section itself used to define the fluid dynamic cross section of a figure eight cross section which is exposed to the fluid stream where the resulting local stagnation region caused by impinging flow at its point of separation against an electrical conductor is therefore small with respect to the conductor cross section, each conductor exhibiting a change in electrical resistivity as a function of temperature; and,
e. each of said electrical conductors being provided with electrical connection means, whereby each electrical conductor can be electrically heated by an electrical current passing through each conductor.

3,900,820
LINE SUPERVISORY CIRCUIT
Cyrus Frank Ault, Wheaton, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Feb. 25, 1974, Ser. No. 445,060
Int. Cl. H01h *29/00*
U.S. Cl. 335—52 **6 Claims**



1. An electrical switch device comprising
a magnetic armature movably mounted in its longitudinal axis,
a first and a second spaced-apart terminal between said armature and a backup means along a second axis transverse to said longitudinal axis,
means for completing an electrical circuit between said terminals comprising a pliant, electrically conductive globule positioned between said armature and said backup means in said first axis and between said terminals in said second axis, and
means for moving said armature against said globule to distort said last-mentioned globule into contact with said terminals comprising an energizable winding coupled to said magnetic armature.

3,900,821
INTEGRATED FREQUENCY SELECTIVE DEMODULATION CIRCUIT
Keith Knubbe, Cupertino; Werner H. Hoeft, San Jose, and Gary Kelson, Santa Clara, all of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.
Filed Dec. 17, 1973, Ser. No. 425,216
Int. Cl.[2] H03D *3/24*
U.S. Cl. 329—122 **3 Claims**



1. An integrated frequency selective demodulator circuit for demodulating a frequency modulated (FM) input signal having a fixed carrier frequency comprising: a frequency oscillator of fixed frequency, a first mixer for mixing said FM input signal with said oscillator frequency to provide an FM difference signal having a carrier frequency substantially less than said input signal carrier frequency; a phase-locked loop (PLL) detector coupled to said first mixer and demodulating said FM difference signal said PLL detector including a second mixer, filtering means coupled to the output of said second mixer and providing a filtered output serving as a frequency control signal and a voltage controlled oscillator

(VCO) coupled between the output of said filtering means and said second mixer for providing an output signal to said second mixer for tracking said difference signal said VCO having a fixed value timing capacitor; a semiconductive substrate in which said first mixer and said PLL detector are integrated, said VCO having a free running frequency determined exclusively by fixed value components which are substantially integrated into said substrate and by said fixed value timing capacitor which is external to said substrate; and audio amplifier means for amplifying said frequency control signal.

3,900,822

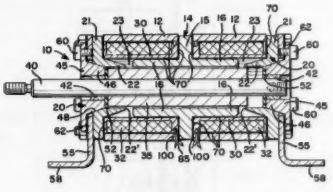
PROPORTIONAL SOLENOID

David R. Hardwick, Dayton, and George T. Coors, Tipp City, both of Ohio, assignors to Ledex, Inc., Dayton, Ohio

Filed Mar. 12, 1974, Ser. No. 450,310

Int. Cl. H01f *7/18*

U.S. Cl. 335—268 **7 Claims**



1. For use with double and single acting solenoids, the combination comprising an annular hub having an abutment portion defining a radial wall and a cylindrical sleeve portion, a base axially spaced from said hub, means on said base forming an annular pole portion and having means defining a second radial wall in axially spaced relation to said hub wall, a cylindrical axially extended armature, means mounting said armature for axial movement within said hub, an electrical coil assembly including a spool-shaped coil form made essentially of high heat conductive material, said coil form having an inside surface received on said hub sleeve portion and having radial end faces in respective heat transferring abutment with said hub and base walls, an electrical coil wound on said form, and one end of said coil form having means defining a radially outwardly opening channel proportioned to receive the magnet wire of said coil and to receive the external power leads therein providing a space for electrical connection with said coil wires.

3,900,823

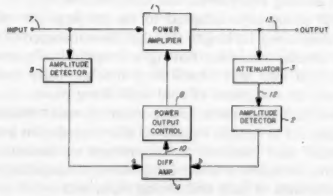
AMPLIFYING AND PROCESSING APPARATUS FOR MODULATED CARRIER SIGNALS

Nathan O. Sokal, and Alan D. Sokal, both of 4 Tyler Rd., Lexington, Mass. 02173

Filed Mar. 28, 1973, Ser. No. 345,509

Int. Cl. H03y *3/00*

U.S. Cl. 330—149 **20 Claims**



1. In a signal processing system of the type having

1. a system input terminal for receiving the signal to be processed,
2. a system output terminal at which the processed signal is provided,
3. a power amplifier having its output fed to the system output terminal,
4. means coupling the system input terminal to the input of the power amplifier,
5. control means for controlling the amplitude of the output of the power amplifier,
6. a differential amplifier having its output connected to the control means and emitting an error signal thereto in response to the input signals applied to the differential amplifier,
7. means providing a first signal path connecting the system input terminal to a first input of the differential amplifier, the first signal path having in it an amplitude detector,
8. means for sensing the output of the power amplifier and providing an electrical signal related thereto, and
9. means providing a second signal path connecting the output sensing means to second input of the differential amplifier, the second signal path having in it an amplitude detector,

the improvement wherein

at least one of the first and second signal paths has a nonlinear function generator in it which acts upon the signal fed by that path to the differential amplifier.

3,900,824

METHODS OF PREVENTING CYCLE SKIPPING IN PROCESSING ACOUSTIC WELL-LOGGING SIGNALS

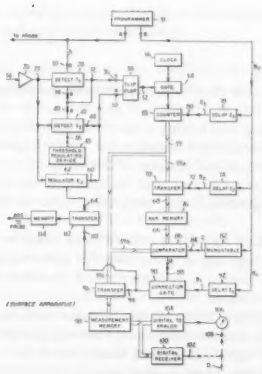
Jean Claude Trouiller, Chaville, and Guy Lafont, Paris, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Feb. 16, 1973, Ser. No. 332,926

Claims priority, application France, Feb. 17, 1972, 72.05300

Int. Cl. G01v *1/40*

U.S. Cl. 340—15.5 AC **5 Claims**



1. A method of correcting random errors in the measurement of the transit time between two points of an acoustic wave in earth formations traversed by a borehole, comprising the steps of

lowering an acoustic well-logging probe into a borehole,

generating successive acoustic waves by means of said probe,

generating a composite electric signal corresponding thereto,

generating measurement signals responsive to said composite electric signal and representative of the transit time of said acoustic waves between first and second points during successive measurement sequences, said first and second points in successive measurement sequences being respectively relatively close to each other,

comparing the measurement signals representative of successive measurements, whether or not valid, to determine whether their difference in absolute value exceeds a threshold value, and

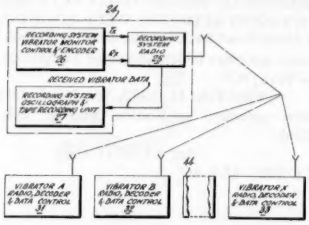
making a record as a function of depth of valid measurements, said valid measurements corresponding, in cases where said difference is smaller than said threshold, to the later of said measurement signals and, in other cases, to the measurement signal representative of the latest previous valid measurement.

3,900,825

VIBRATOR-TYPE REFLECTION SEISMIC SURVEYING

Harris O. Hinnant, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Oct. 24, 1973, Ser. No. 409,202
Int. Cl. G01v 1/22
U.S. Cl. 340—15.5 TS **4 Claims**



1. In vibrator-type reflection seismic surveying, in combination with

a recording unit having a spread of seismic detectors electrically connected thereto for recording seismic signals received at the surface of the earth,

at least one vibrator unit including a mechanical seismic-wave generator for projecting seismic signals into the earth,

each of said recording and vibrator units having an electrical sweep signal generator for generating a frequency sweep having a predetermined duration and frequency characteristic,

said recording unit and said vibrator each having means for remote communication and timing means for starting said sweep signal generators simultaneously,

said recording unit having means for generating a control pulse for activating all of said timing means,

the improvement comprising

means for generating a signal in accordance with at least one parameter of each of said vibrator unit,

remote communication means for transmitting said parameter signal to said recording unit, and

code means associated with said recording unit for selecting a predetermined one of said vibrator unit parameter signals for transmission,

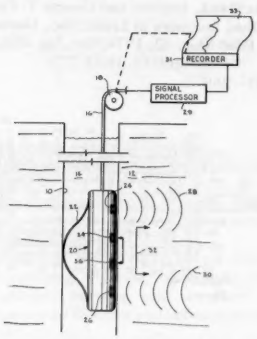
whereby a selected vibrator unit may have a predetermined parameter monitored with each recording of seismic signals generated by said vibrator unit.

3,900,826

ACOUSTIC PERMEABILITY LOG UTILIZING DIFFERENTIAL TRAVEL TIME MEASUREMENTS

Donald J. Dowling, and John F. Boyd, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 31, 1973, Ser. No. 411,561
Int. Cl. G01v 1/40
U.S. Cl. 340—15.5 TN **11 Claims**



1. A method for measuring permeability of a formation adjacent to a borehole comprising the steps of:

exciting the formation by imposing acoustic radiation on the formation from two sources, one forming a compressive wave front and the other forming a rarefaction wave front to create fluid flow in the formation; and,

measuring the transit time of acoustic energy in the formation as modified by the fluid flow to determine the change in transit time as a measure related to the permeability

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3,900,827

TELEMETERING SYSTEM FOR OIL WELLS USING REACTION MODULATOR

Arthur E. Lamel, Arcadia; William D. Squire, and Harper J. Whitehouse, both of San Diego, all of Calif., assignors to American Petroscience Corporation, Bakersfield, Calif.

Division of Ser. No. 113,147, Feb. 8, 1971, Pat. No. 3,790,930.
This application Sept. 12, 1973, Ser. No. 396,411
Int. Cl. G01v 3/18
U.S. Cl. 340—18 NC **12 Claims**

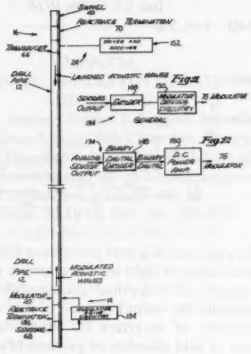
1. In an acoustic signal modulation and transmission system in well drilling equipment, the combination of:

a drill string pipe adapted to the propagation of acoustic waves along its length through the substance of said pipe, a tubular member, having a longitudinal passage, connected into and functioning mechanically and acoustically as a segment of said drill string pipe,

a modulating means in juxtaposition to said tubular member adapted to couple to said tubular member in a manner to cause said member to experience an acoustic reaction force in reaction to acoustic waves propagating within the substance of said drill string pipe, and

said modulating means being responsive to a modulating signal applied thereto to vary the magnitude of said coupling and thereby said acoustic reaction force, whereby to

generate within the substance of said tubular member modulated acoustic waves derived from acoustic waves



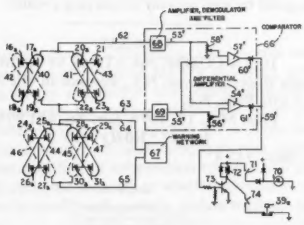
already propagating along the length of said drill string pipe.

3,900,828

ON-BOARD TIRE STRUT FAULT APPARATUS FOR AIRCRAFT AND THE LIKE

David A. Lage, Woburn, and Donald A. Senour, Carlisle, both of Mass., assignors to BLH Electronics, Inc., Waltham, Mass.

Filed July 26, 1974, Ser. No. 492,209
Int. Cl.[2] G08G *1/12*
U.S. Cl. 340—27 R **11 Claims**



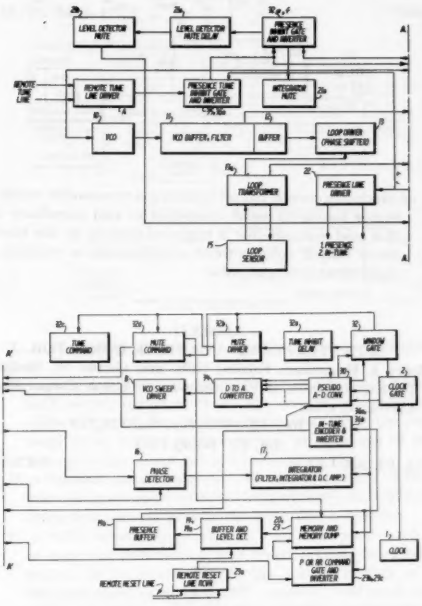
1. Apparatus for sensing and signalling faults associated with a suspension structure for vehicles and the like having a plurality of spaced load-carrying supports such as wheels and the like, comprising a plurality of strain-gage transducer means each producing an electrical output characterizing the loading being carried by a different one of said supports, electrical comparator means for producing output signals characterizing differences between two input signals applied thereto, means applying as input signals to said comparator means a first signal related to the first electrical output from at least one of said transducer means and a reference signal related to a selected portion of the second electrical output from at least one other of said transducer means, and fault-signalling means responsive to said output signals from said comparator means, whereby said input signals to said comparator means tend to vary together with changes in the overall loading experienced by said suspensions structure and said differences between said input signals tend to increase upon occurrence of a fault which reduces the load carried by one of said supports and which causes the other of said supports to carry a greater share of the overall loading.

3,900,829

AIRPORT LOOP DETECTOR SYSTEM

Lennart Ernst Long, Waltham, Mass., assignor to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Oct. 17, 1973, Ser. No. 407,213
Int. Cl.[2] G08G *1/01*
U.S. Cl. 340—38 L **8 Claims**



1. An object detector system to detect the entry of metallic objects into a defined loop comprising:

an oscillator;

a tank circuit connected to the oscillator to generate an electromagnetic field to define the loop, the inductance of the tank circuit varying in response to the entry of a metallic object into the loop;

first incremental voltage frequency tuning means to derive a signal indicative of the change in inductance of the tank circuit;

amplifier means to amplify said signal indicative of the change in inductance of the tank circuit;

output means connected to the amplifier to provide an indication as to the "presence" or "no presence" of an object within the loop;

second means connected to the amplifier to determine if the amplifier is operating in its most sensitive range; and

frequency retuning means connected to the second means to cause a correction signal to be fed to the oscillator to drive the amplifier to operate in its most sensitive range.

3,900,830

PIEZOELECTRIC TRAFFIC COUNTER SWITCH AND ASSOCIATED PULSE GENERATOR CIRCUIT

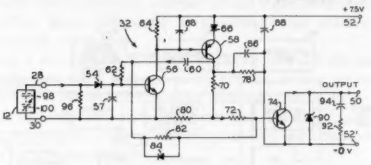
Henry O. Peterson, Portland, Oreg., assignor to Leupold & Stevens, Inc., Beaverton, Oreg.

Filed Aug. 15, 1974, Ser. No. 497,564
Int. Cl.[2] G08G *1/00*
U.S. Cl. 340—38 R **11 Claims**

1. A vehicle sensor apparatus in which the improvement comprises:

a fluid tube means for producing a pressure wave within said tube when a vehicle contacts such tube;

a piezoelectric transducer means coupled to an open end of said tube for producing an electrical output pulse in response to receipt of said pressure wave; and



an electronic switch circuit including a monostable multivibrator having its input connected to said transducer so that said multivibrator is triggered directly by the transducer output pulse without amplification to produce a multivibrator output pulse.

3,900,831

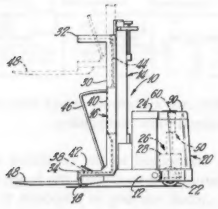
OPERATION LAMP AND STEER INDICATOR

Henry J. Houseman, Fairless Hills, and Gerald W. Skulley, Doylestown, both of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed July 12, 1973, Ser. No. 378,753

Int. Cl.[2] B60Q *1/00*

U.S. Cl. 340—52 R **8 Claims**



1. In a vehicle having a frame, at least one steerable ground engaging wheel for guiding movement of said vehicle, and an operator's station positionable remotely above said steerable wheel: support means operatively mounting said steerable wheel to said frame for steering rotation about a substantially vertical axis and for rotation about a substantially horizontal axis, a light transmitting member operatively connected to said steerable wheel for rotation about said vertical axis and having a light receiving surface and a light emitting surface, and a light source including an electrical circuit for energization thereof, said electrical circuit having an electrical flasher unit connected electrically in series with said light source and connected electrically in parallel with a normally closed battery discharge indicator, opening of said discharge indicator due to a low battery voltage condition putting said flasher in series with said light source to cause said light source to flash indicating a low battery voltage condition, said light source being operatively mounted on said frame in position to illuminate said light receiving surface, and said light emitting surface being oriented in a fixed predetermined position relative to said horizontal axis capable of indicating the orientation of said steerable wheel to an operator at said operator's station positioned remotely from said steerable wheel.

3,900,832

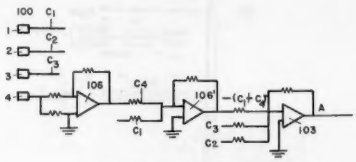
BAR CODE PROCESSING AND DETECTING SYSTEM

Leland J. Hanchett, Winchester, Mass., assignor to Taplin Business Machines Incorporated, Burlington, Mass.

Filed Sept. 17, 1973, Ser. No. 398,035

Int. Cl. G06k *9/18*

U.S. Cl. 340—146.3 Z **2 Claims**



1. A bar code reading and processing system including

a. a linear array of light sensitive sensor cells;

b. a plurality of individual pre-amplifiers for amplifying individually the output of each of said cells of said array;

c. a plurality of inverters for inverting the output of a portion of said plurality of pre-amplifiers;

d. a plurality of summing amplifiers for adding the non-inverted outputs and the inverted outputs of said plurality of pre-amplifiers;

e. a plurality of parallel connected diodes each in the output circuit of one of said plurality of summing amplifiers; and

f. a quantizer circuit connected to said plurality of diodes, said quantizer circuit including

g. a pair of parallel connected amplifying circuits both connected to the output of said plurality of diodes, said pair of amplifying circuits including

h. a first amplifying circuit having a capacitor charged through a diode and means for short-circuiting said diode in intervals of time;

i. a second amplifying circuit including a delay line; and

j. a comparator having a pair of inputs of which one is energized by said first amplifying circuit and the other is energized by said second amplifying circuit.

3,900,833

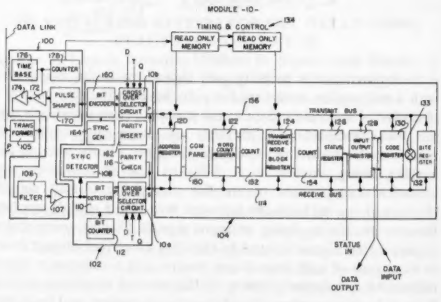
DATA COMMUNICATION SYSTEM

R. Timothy Rogers, Wayne, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Mar. 18, 1974, Ser. No. 451,974

Int. Cl.[2] H04Q *9/00*

U.S. Cl. 340—147 C **10 Claims**



1. In a digital data transmission system, an interface module for coupling a subsystem, or the like, to a common communication link and which includes:

a receiving section having a decoder for accepting and detecting multi-section control words and data words;

a common bus connected to said decoder in said receiving section for receiving detected control words and data words from the decoder;

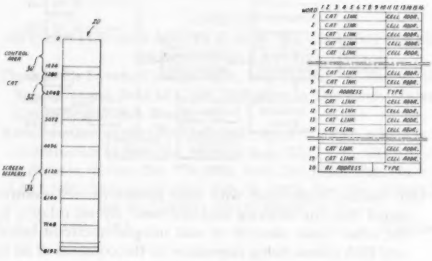
a plurality of logic elements having inputs parallel coupled to said common bus; and

logic circuitry connected to said logic elements for steering the individual sections of the control word into different ones of said logic elements.

3,900,834
MEMORY UPDATE APPARATUS UTILIZING CHAIN ADDRESSING

Richard C. Casey, Darien; Robert J. Duggan, Monroe; Stephen A. Grosky, Monroe; Dixson Teh-Chao Jen, Monroe; John J. Serra, Monroe; Donald Shaffer Whitehead, New Haven, and Thomas E. Boyce, Milford, all of Conn., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Sept. 5, 1972, Ser. No. 286,575
Int. Cl. G06f *7/28, 15/40, 13/00*
U.S. Cl. 340—172.5 **32 Claims**



1. In a system having a programmable control unit for receiving, storing and updating rapidly changing information concerning a large plurality of different data items, said unit including a memory for storing information relating to a plurality of different items, information for a given item being stored at one or more memory locations therein, apparatus for effecting the updating of information relating to a given item at all locations in the memory at which information relating to a given item is stored with a single update message to the unit comprising:

address table storing means having a plurality of storage locations for storing a table comprised of a plurality of entries, each stored in a different storage location, each of said entries containing a cell address identifying a different item storing memory location and a chain address identifying another storage location storing a table entry;

table entry accessing means responsive to an update message relating to the given item for accessing a first table entry from one of said storage locations;

updating means responsive to the cell address in an accessed table entry and to said update message for updating the information for the item at the identified memory location;

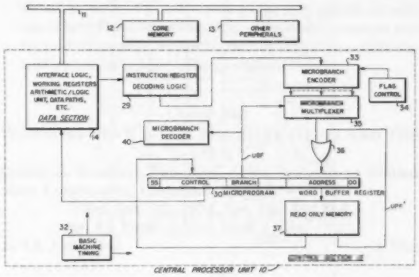
said table entry accessing means including means responsive to the chain address in a previously accessed table entry for accessing the next table entry from the storage location identified by the chain address;

said updating means and said table entry accessing means being repetitively operative until all memory locations containing information relating to the given item have been updated.

3,900,835
BRANCHING CIRCUIT FOR MICROPROGRAM CONTROLLED CENTRAL PROCESSOR UNIT

C. Gordon Bell, Lincoln; John E. Buzynski, Townsend; Charles H. Kaman, Newton Highlands, and James F. O'Loughlin, Westford, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Sept. 24, 1973, Ser. No. 400,342
Int. Cl. G06f *9/16*
U.S. Cl. 340—172.5 **5 Claims**



1. A microprogram configured central processor comprising:

A. a read-only memory for storing microprogram words, each microprogram word having a control portion and an address portion for at least partly identifying the next word to be retrieved in sequence, at least one of the microprogram words being a branching word,

B. a modifier circuit receiving the address portion of each microprogram word retrieved from memory and for modifying that address in response to certain conditions,

C. a buffer register for storing each microprogram word to be executed in sequence, said buffer register being connected for receiving directly the control portion of a microprogram word from said memory, said read-only memory including means for retrieving a next word thereupon in response to the address portion in said buffer register.

D. timing means for defining alternate ready and transfer intervals, said modifier circuit being enabled during a ready interval and producing a modified address for transfer to said buffer register during a subsequent transfer interval.

3,900,836
INTERLEAVED MEMORY CONTROL SIGNAL HANDLING APPARATUS USING PIPELINING TECHNIQUES

George P. Salvo, Poughkeepsie, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Nov. 30, 1973, Ser. No. 420,492
Int. Cl.[2] G06F *9/00*
U.S. Cl. 340—172.5 **4 Claims**

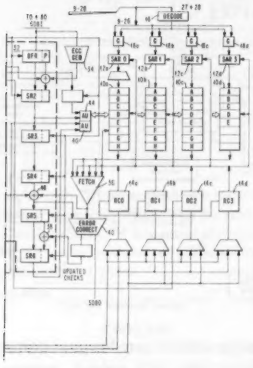
1. In an interleaved memory having a plurality of storage units each of which internally uses a plurality of timed operating pulses that are generated by a separate ring counter driven by a clocking source which determines the intervals at which the storage units can be operated, an improved storage control unit comprising:

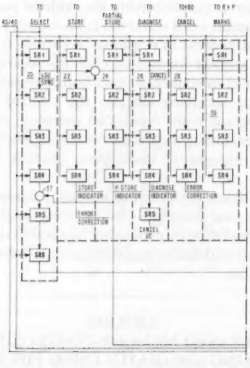
a. a plurality of multi stage shift registers driven by said clocking source for receiving control information for instructing the memory to perform either a fetch, store or partial store operation;

b. means for supplying a control signal to at least the ring counter supplying operating pulses to the storage unit of interleaved memory being accessed and to the shift registers to start the ring counter and the shift registers so that as a result of the shift registers being driven by the same

clocking source as the ring counter the shift registers and ring counter operate in synchronism; and

c. logic means coupling inputs of the memory units to selected stages in first plurality of shift registers for generating control signals that permit the passage of data into the





accessed memory unit only at those times that the control signals generated from the control information in the selected stages of the plurality of shift registers indicates data should be entered into the accessed memory unit of the interleaved memory to perform one of the fetch, store or partial store operations.

3,900,837

VARIABLY ADDRESSABLE SEMICONDUCTOR MASS MEMORY

John C. Hunter, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Feb. 4, 1974, Ser. No. 439,677

Int. Cl. G11c *13/00, 11/40*

U.S. Cl. 340—173 R **8 Claims**

1. An integrated-circuit store having connected thereto from an external source means for transmitting an address signal, means for transmitting a data signal, and means for transmitting at least one control signal and adapted to receive address and control signals from said external source and to transfer data signals to and from said external source, said store comprising a body of semiconductor material, a plurality of basic circuits formed on said body of semiconductor material as a common substrate, and means for connecting said transmitting means to at least one of said plurality of basic circuits, each one of said basic circuits comprising:

a bus portion including at least one address signal line, a data signal line, and a plurality of control signal lines, said bus portion interconnecting said plurality of basic circuits;

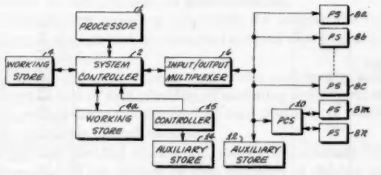
first means for storing said data signals;

second means for storing an address;

third means for storing at least one status signal;

means responsive to said third storage means for selectively enabling said second storage means to store a unique address transmitted over said address signal line;

fourth means for selectively inhibiting the operation of said enabling means, said fourth means being responsive to the contents of said third means and to an inhibit control signal transmitted over a predetermined one of said control signal lines;



fifth means, associated with said predetermined control signal line, for ordering said one basic circuit relative to the other basic circuits of said integrated-circuit store, said fifth means being responsive to the contents of all of said third means of the basic circuits of higher order than said one basic circuit to selectively generate said inhibit control signal over said predetermined control signal line to the basic circuits of lower order;

means for controlling the transfer of dtat signals between said data signal line and said first storage means;

means responsive to a comparison between address signals received over said at least one address signal line and said stored address for actuating said controlling means;

second means for connecting said at least one address signal line to said actuating means, for connecting said data signal line to said first storage means, and for connecting said control signal lines to said third storage means; and means for disabling said second connecting means, thereby disconnecting said one basic circuit from said signal bus.

3,900,838

HYBRID STORAGE CIRCUIT

Siegfried Kurt Wiedmann, Stuttgart, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,700

Claims priority, application Germany, Feb. 27, 1973, 2309616

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 R **16 Claims**

1. A low power dissipating memory cell comprising:

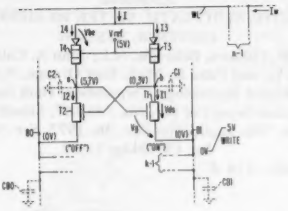
a pair of field effect storage transistors, each having two current conducting terminals and a gate terminal, a first one of said current conducting terminals of each field effect storage transistor being connected to the gate terminal of the other field effect storage transistor to form a bistable storage circuit;

a pair of bipolar load transistors, each having an emitter, collector and base terminal, the emitter-collector path of

each of said bipolar load transistors being serially connected to said first one of said current conducting terminals of each of said pair of field effect storage transistors;

a pair of bit lines, each bit line connected to the second current conducting terminal of one of said field effect storage transistors; and

a word line commonly connected to both of said bipolar load transistors.



3,900,839

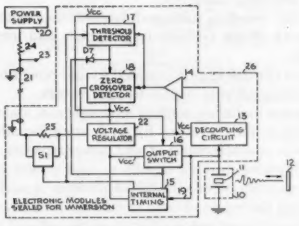
APPARATUS AND METHOD FOR MEASURING SPEED OF SOUND IN LIQUID

Thomas H. Lynch, Canoga Park, and Hudson T. Patten, III, Santa Susana, both of Calif., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 242,261, April 7, 1972, which is a continuation of Ser. No. 10,686, Jan. 22, 1970, which is a division of Ser. No. 776,998, Nov. 19, 1968, Pat. No. 3,522,580. This application Feb. 8, 1974, Ser. No. 440,913

Int. Cl.[2] **G08C** *19/16;* **G01V** *1/00*

U.S. Cl. 340—203 **3 Claims**



1. In a system for monitoring measurements made at a remote location from the monitoring location, the combination of:

measuring means at said remote location, said measuring means having an electrical signal output whose repetition rate varies as a function of a physical input,

a power cable extending between said monitoring location and said remote location,

an electrical power source at said monitoring location for providing electrical power for said measuring means,

a first resistance means at said monitoring location connected between said electrical power source and said cable,

a second resistance means at said remote location having one end connected to said power cable,

a switch means connected in parallel with said second resistance means and coupled to said electrical signal output for shunting said second resistance means at a rate in accordance with the repetition rate of said electrical signal output,

a voltage regulator at said remote location having its input connected to the other end of said second resistance means and its output connected to said measuring means for providing a stabilized voltage output for said measuring means, and

means coupled to the other end of said second resistance means for holding said other end at a substantially fixed potential in the presence of the shunting provided by said switch means, the resulting output voltage signal at the junction between said power cable and said second resistance means thereby having a repetition rate which varies in accordance with the rate of shunting of said second resistance means by said switch means, said resulting output voltage signal propagating to said monitoring location via said power cable to thereby permit monitoring at said monitoring location of the measurements made by said measuring means by monitoring rate variations of said resulting output voltage signal.

3,900,840

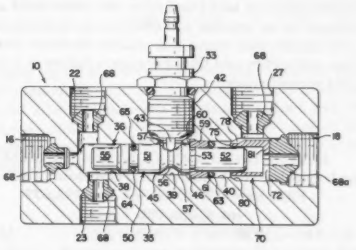
WARNING DEVICE FOR BRAKE SYSTEMS AND THE LIKE

Kenneth B. Swanson, Bannister, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Feb. 22, 1974, Ser. No. 444,765

Int. Cl. G08b *21/00;* **B60t** *11/34, 17/22*

U.S. Cl. 340—242 **1 Claim**



1. A failure warning device for indicating a pressure differential between first and second fluid-pressurized systems, said device comprising:

a housing;

a cylindrically stepped bore within said housing;

said bore having a first portion at one end thereof, a second intermediate portion larger than said first portion, and a third portion larger than said second portion at the opposite end of said bore, said first portion in fluid communication with said first fluid-pressurized system, said third bore portion in fluid communication with said second fluid-pressurized system;

a cylindrically stepped shuttle-piston within said bore, said piston having a large diameter portion disposed within said first bore portion and a smaller diameter portion within said third bore portion;

a reset sleeve member receiving said small diameter piston portion and disposed within said third bore portion, said sleeve having an axial end positioned at the juncture of said second and third bore portions and at the juncture of said first and second piston portions when said fluid-pressurized systems are at approximately equal pressures to maintain said piston in a centered position within said bore;

a first seal between said large diameter piston portion and said first bore portion preventing fluid communication from said first bore portion to said second bore portion independent of the axial position of said piston within said bore;

a second seal within said third bore portion at the opposite axial end of said sleeve preventing fluid communication between said third bore portion and said second bore portion independent of the axial position of said piston within said bore;

signal means associated with said piston and extending within said second bore sensing axial displacement of said piston within said bore to actuate a signal device in response to said axial displacement;

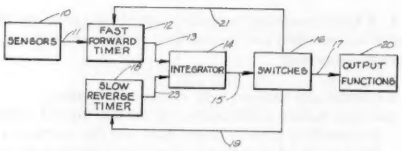
said device further includes stop means limiting displacement of said piston in one axial direction within said bore when failure occurs in said second brake system;

said stop means including an inlet port in said housing in fluid communication with said second system and axially aligned with and at the end of said third bore portion, an outlet port in said housing angularly disposed from said inlet port and a cylindrically-hollowed, open-ended retainer disposed within said third bore between said inlet and outlet ports; and said retainer having a base surface with an opening therethrough at one of its axial end faces abutting a stop defined by said inlet port, said smaller diameter piston always extending within said retainer with the retainer length such that the interior of said base surface is in engagement with the end of said smaller diameter piston portion when said piston is axially shifted in one direction upon failure in pressure of said second system, and a plurality of flutes formed about the exterior of said retainer for supporting said retainer in said bore while defining a plurality of longitudinally-extending slots permitting unimpeded fluid communication between said outlet port and said third bore, the other axial end face defined as an annulus and effective to maintain said first seal undeformed about said smaller diameter piston portion and within said third bore upon failure in pressure of said second system.

3,900,841
INTRUSION ALARM CONTROL SYSTEM

Ernest J. Buckles, 4604 Moore Rd., Middletown, Ohio 45042

Filed Mar. 22, 1974, Ser. No. 453,677
Int. Cl.[2] G08B *13/02*
U.S. Cl. 340—258 R **16 Claims**



1. An intrusion alarm control system for protecting property against intrusion comprising:

a. at least one sensor associated with said property for producing an output signal in response to an intrusion;

b. timing means having first and second inputs, said first timing means input being connected to said sensor, said timing means producing first and second groups of sequential, preselected timing signals defining, respectively, first and second timing cycle portions, wherein said first group of preselected timing signals are reversibly produced in response to said output signal from said sensor at a rate reflecting the severity of said intrusion, and said second group of preselected timing signals are irreversibly produced in response to a signal at said second input of said timing means;

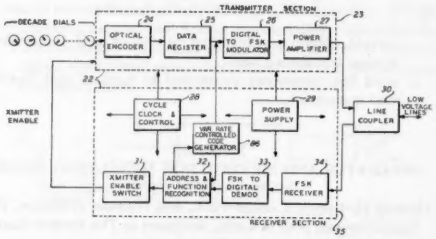
c. a plurality of switches each having an input and an output, said inputs of said switches being connected to said timing means, and a first one of said switches having its output connected to said second timing means input, each of said switches being actuatable by at lease one of said preselected timing signals of at least one of said groups, said first switch being actuatable by the last one of said preselected timing signals of said first group, whereby, actuation of said first switch causes said timing means to initiate production of said second group of sequential preselected timing signals; and

d. a plurality of output functions each connected to one of said outputs of one of said switches other than said first switch, each of said output functions being activated upon actuation of its respective one of said switches.

3,900,842
REMOTE AUTOMATIC METER READING AND CONTROL SYSTEM

Salvatore R. Calabro, Belleville, N.J.; John A. Calabro, Forest Hills, N.Y., and Peter R. Mich, East Orange, N.J., assignors to Automated Technology Corporation, Hackensack, N.J.

Continuation-in-part of Ser. No. 346,167, March 29, 1973, abandoned. This application Dec. 26, 1973, Ser. No. 427,724
Int. Cl. H04m *11/04*
U.S. Cl. 340—310 A **7 Claims**



1. A system for remote reading of data measured by consumption meters, comprising in combination:

a plurality of consumption meters, positioned at selected field points, each said meter including means for translating the readings thereof into one of a plurality of digitally encoded forms;

means at each of said meters for modulating the carrier with said encoded data;

means for coupling said modulated carrier onto the power network of the community in which said meters are located;

a central control station coupled to said power network, for providing address signals to said meters;

said meters including address return means; and said central station including means for evaluating the address transmission characteristics of said power network, and means for applying control signals to said power network for selection of one of said encoded forms at said meters, for varying the mode of data transmission in response to the detected transmission characteristics of said network.

3,900,843
GYRO PICKOFF APPARATUS TO SENSE DEVIATIONS OF A VEHICLE AXIS FROM A GYRO SPIN AXIS

Lincoln S. Ferriss, Madison, N.J., assignor to The Singer Company, Little Falls, N.J.

Division of Ser. No. 286,024, Sept. 5, 1972, Pat. No. 3,808,542. This application Aug. 15, 1973, Ser. No. 388,602
Int. Cl. H03k *13/20*
U.S. Cl. 340—347 AD **6 Claims**

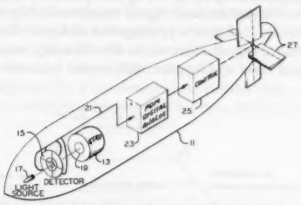
1. Gyro pickoff apparatus to sense deviations of a vehicle axis from the gyro spin axis comprising:

a. a silicon optical detector divided into four quadrants by mutually perpendicular X and Y planes having their intersection coincident with the vehicle axis fixed to the vehicle and providing a separate output for each quadrant;

b. a light source and a mirror mounted on the gyro and arranged to reflect light from said source onto said detector such as to trace a circle centered at the center of said detector when said detector and gyro are aligned to activate said detector sequentially as said gyro rotates and adapted to activate each quadrant for equal periods of

time when said gyro and detector are aligned whereby misalignment will cause said circle to shift thereby causing said detector to output signals of unequal duration from said four quadrants;

c. resolving means to convert said four quadrant outputs into two pulse duration modulated signals proportional respectively to an X and Y deviation of the vehicle;

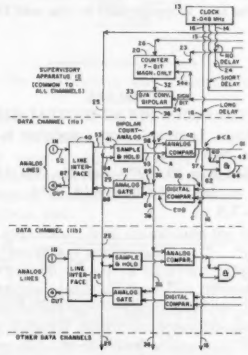


d. first and second pulse duration modulation to digital conversion means to convert the said X and Y signals to digital outputs each of said digital outputs being proportional to the ratio of the "on" time to the total pulse cycle time of its respective pulse duration modulated input.

3,900,844
ANALOG AND DIGITAL DATA INTERCONVERSION SYSTEM

Leon D. Wald, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 3, 1973, Ser. No. 402,991
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 C **6 Claims**



1. Apparatus for interconverting analog and digital signals comprising, in combination:

a source of clock pulses;

a cycle strobe pulse source for giving a strobe pulse output after eaeh predetermined number of clock pulses;

an n-bit, 2's complement counter giving a first count output which cyclicly passes through a range of values extending from a maximum to a minimum;

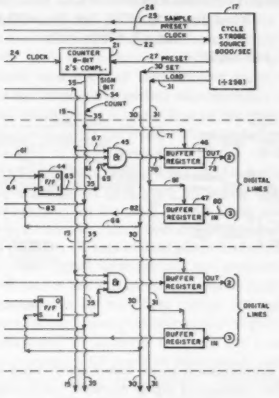
a (n−1)-bit, magnitude-only counter giving a second count output which cyclicly passes through a range of values extending from a maximum to a minimum;

means connecting said counters for simultaneous actuation by said clock pulses;

means for presetting said counters to maximum values in response to said strobe pulse output;

a bipolar digital-to-analog converter giving an analog output determined in magnitude by the second count output and in sign by a sign bit from said n-bit counter; and

a converter channel including first and second converting means each receiving the first count and analog outputs, said first converting means for receiving an input digital signal and including means comparing the input digital signal with the first count output and giving an output signal determined by the value of the analog output at the time the first count output becomes equal to the input

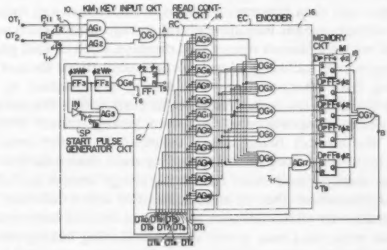


digital signal, said second converting means for receiving an input analog signal and including means comparing the input analog signal with the analog output and giving a digital output signal determined by the value of the first digital output at the time the analog output becomes less than the input analog signal.

3,900,845
KEY INPUT CIRCUIT

Takao Tsuiki, Kokubunji, and Yoshikazu Hatsukano, Kodaira, both of Japan, assignors to Hitachi, Ltd., Japan

Filed July 23, 1973, Ser. No. 381,486
Claims priority, application Japan, July 21, 1972, 47-72532
Int. Cl. H04l *15/06*
U.S. Cl. 340—365 E **9 Claims**



1. A key input circuit comprising key controlled means for providing respective key signals representing selective key actuation, said key controlled means comprising a plurality of keys, timing pulse generator means for generating a series of sequential timing pulses and means for applying a respective timing pulse to one terminal of each of said keys, another terminal of each of said keys being connected together to a common terminal providing said key signals; read control circuit means responsive to said key signals for generating respective output signals. said read control circuit means comprising a plurality of AND gates each directly receiving the output of said common terminal, a respective one of said timing pulses and a control signal; and gate means responsive to said output signals for generating said control signal to inhibit further operation of said read control circuit means.

3,900,846

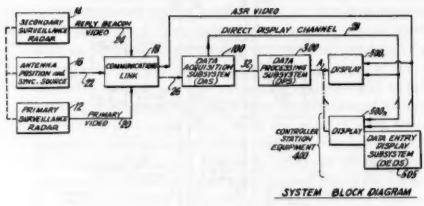
COMPUTER AUTOMATED RADAR TERMINAL SYSTEM

John Gibbon, Morris Plains; Burt Heacock, Berkeley Heights; Richard Lipnick, Scotch Plains; John Strenkowski, Wippany, and Matthew Tutino, Basking Ridge, all of N.J., assignors to Lockheed Electronics Co., Inc., Plainfield, N.J.

Filed Jan. 14, 1974, Ser. No. 432,885

Int. Cl. G01s *9/56*

U.S. Cl. 343—6 R **45 Claims**



1. In combination in an automated radar data processing system for displaying alpha-numeric information characterizing beacon wave returns generated by aircraft-mounted transponders within the area of said system responsive to secondary surveillance radar interrogations and a primary surveillance radar video wave produced by non-cooperative reflections from said aircraft; said system comprising data acquisition means for receiving said beacon wave returns, said data acquisition means including means for providing a regenerated beacon code wave, a digital range wave characterized by a monotonically increasing value related to the time elapsed since the last emitted secondary surveillance radar interrogation, and digital azimuth information corresponding to the orientation of the secondary surveillance radar when the last transponder interrogation pulse was issued therefrom; data processing means for receiving said signals provided by said data acquisition means; and display means, including plural displays, for displaying alpha-numeric information supplied thereto by said data processing means and for displaying said primary surveillance radar video wave which is supplied thereto; said data processing means includes memory means, said memory means including plural storage means each associated with a different one of said displays, each of said plural storage means including plural storage subportions thereof for storing data characterizing the display presentation to be made for different ones of subject aircraft within the area of said system, subportions of said plural storage means relating to a like aircraft being linked together by stored pointers therein, said memory means including main data base storage means therein, said main data base storge means including plural subportions therein each associated with a different one of the aircraft within the area of said system, said subportions of said main data base storge means including linking means for storing the address of a subportion of one of said plural storage means storing the display information with respect to a like aircraft.

3,900,847

SATELLITE AIDED VEHICLE AVOIDANCE SYSTEM

Ernest R. Steele, 100 North St., Bath, Maine 04530, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Jan. 21, 1972, Ser. No. 219,722

Int. Cl. G01s *9/56*

U.S. Cl. 343—6.5 R **20 Claims**

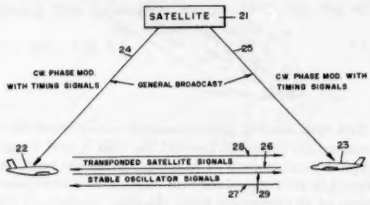
1. A method of measuring range from a protected vehicle to an intruding vehicle with the aid of a signal transmitted by a satellite to a population of vehicles comprising the steps of:

receiving in each of the vehicles the satellite transmitted signal;

transponding the satellite transmitted signal by said intruding vehicle;

receiving the transponded signal in said protected vehicle;

utilizing in said protected vehicle the satellite transmitted signal, directly received by said protected vehicle, and the satellite transmitted signal transponded by said intruding vehicle, to derive a propagation delay of the transponded satellite signal relative to the directly received satellite signal and a Doppler difference between the directly



received satellite signal frequency and the transponded satellite signal frequency;

transmitting by said intruding vehicle an additional signal;

receiving said additional signal in said protected vehicle;

measuring in said protected vehicle the Dopper shift of said additional signal; and

deriving in said protected vehicle the range from said protected vehicle to said intruding vehicle as the product of the said propagation delay, the speed of light, and the ratio of the said Doppler shift to the said Doppler difference.

3,900,848

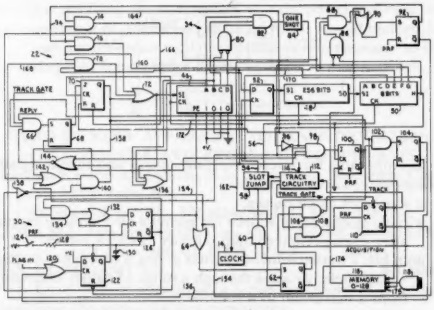
SYNCHRONOUS PULSE DIGITAL FILTER

William E. Mears, Leawood, Kans., assignor to Sperry Rand Corporation, New York, N.Y.

Filed July 20, 1973, Ser. No. 381,344

Int. Cl.[2] G01S *9/16, 9/56*

U.S. Cl. 343—7.3 **19 Claims**



1. In a ranging system employing repeated range scans each initiated by a search pulse, a detector for us in a receiver for locating a synchronous return pulse occurring among random pulses received during each range scan, said detector comprising:

information storage means having a number of memory bits representing a corresponding number of range intervals covering the range being scanned;

input means coupled with said storage means for delivering received pulses thereto for storage in memory, and including means for correlating pulse information stored in

memory during a given range scan with newly arriving pulses received at the same range intervals during a subsequent range scan,

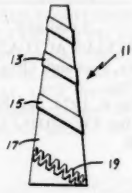
said correlating means causing said storage means to accumulate multiple pulse information at the range at which the synchronous return pulse is occurring and, in each range scan, effecting the destruction of previously stored pulse information at those range intervals where random pulses were received during the previous range scan; and output means responsive to said multiple pulse information for indicating range acquisition when such information corresponds to a predetermined return pulse count sufficient to verify the identity of the synchronous return pulse.

3,900,849

CONICAL UNBALANCED SPIRAL RADAR MODULATOR

William G. Scott, Saratoga; John H. Zickgraf, San Diego, and Dennis A. Petron, Santa Ana, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 17, 1973, Ser. No. 404,460
Int. Cl.[2] G01S 9/02; H01Q 1/38
U.S. Cl. 343—18 D **1 Claim**



1. A system for modulating and reflecting radar signals comprising:

a. a conical surface;

b. a first spiral conductor mounted on the conical surface;

c. a second spiral conductor mounted on the conical surface interleaved between the first spiral conductor and having a zigzag configuration at the wide base of the conical surface; and

d. a variable impedance load connecting the first and second spiral conductors and including

1. first and second sources of time varying voltages,

2. a first varactor having the terminals thereof inductively connected to the first voltage source,

3. a second varactor having the terminals thereof inductively connected to the first voltage source,

4. a third varactor having the terminals thereof inductively connected to the second voltage source,

5. first and second capacitors in series connecting the second and third varactors with the junction of the first and second capacitors being connected to one spiral conductor, and

6. a third capacitor connecting the first and third varactors with the junction of the third varactor and the third capacitor being connected to the other spiral conductor.

3,900,850

DIGITAL PULSE TRAIN TRACKER

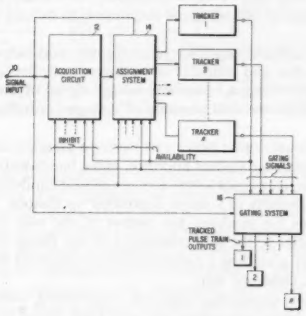
Lynn J. Ulman, Ellicott City, and Raymond G. Green, Baltimore, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 24, 1969, Ser. No. 809,778
Int. Cl.[2] G01S 9/14
U.S. Cl. 343—7.3 **17 Claims**

1. A pulse train tracking system for selectively tracking pulse trains derived from a signal input of composite pulse trains wherein successive pulses of a given train are separated by substantially equal inter-pulse periods, comprising:

first means responsive to a master clock pulse train for digitally measuring the inter-pulse period between a given pulse of said signal input and a successive pulse thereof received within an interval of predetermined minimum and maximum inter-pulse periods after said given pulse, a plurality of second means responsive to said input signal for selectively and independently different respective trains of pulses, and each of said second means being responsive to the inter-pulse period measurement of said first means for establishing a prediction of the inter-pulse period in accordance with the master clock pulse rate and a gate defined by a predetermined number of master clock pulses within which is predicted the occurrence of the next successive pulse of a train including the given and successive pulses for tracking of that train, said first means being operative to effect said digital measurement for each of a plurality of sets of said given and successive pulses in said input signal, in sequence, and available ones of said second means are selectively rendered responsive to said measurements by said first means for independently tracking of the corresponding trains of pulses,

third means responsive to an error between the predicted and actual occurrences of each of successive pulses of that train received within corresponding, successive ones of said gates, said third means controlling said second



means to effect a corresponding correction in the prediction by said second means of the occurrence of the respectively next successive pulses,

said third means including quantizing means responsive to said digital error measurements to produce a digital correction signal in response to receipt and accumulation of a predetermined number of master clock pulses corresponding to said measurements,

said first means also including means to compare inter-pulse periods and establish a prediction of the inter-pulse period of a pulse train to be tracked,

said third means also effecting measurement, at the master clock pulse rate, the magnitude of said errors between said predicted and actual occurrences of said successive pulses of said train of pulses and producing a digital correction signal in response to said digital error measurements,

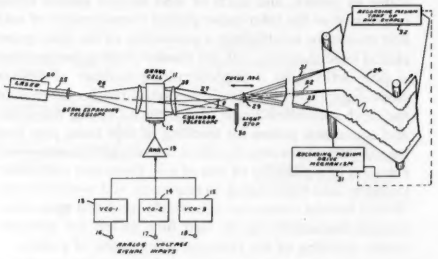
said first means also being responsive to the digital correction signal of said third means for effecting a correction of the prediction of the inter-pulse period of the train of pulses being tracked and said first means being responsive to receipt of a first pulse from said input preceding said given pulse by an inter-pulse period substantially equal to the inter-pulse period measured between said given and successive pulses for effecting said digital measurement.

3,900,851

MULTI-CHANNEL WIDEBAND OSCILLOGRAPH

Shawn G. Bucy, Fairborn, and John Takacs, New Carlisle, both of Ohio, assignors to Abex Corporation, New York, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,268
Int. Cl.[2] G01D 9/30
U.S. Cl. 346—49 1 Claim



1. A multi-channel recording oscillograph for recording oscillographic traces of a plurality of analog voltage input signals comprising:

a. a plurality of voltage controlled frequency modulated oscillators, wherein a separate voltage controlled oscillator is associated with and receives a particular input signal of the said plurality of input signals and provides a separate, respective, determined bandwidth frequency modulated output signal responsive to its said input signal;

b. a broadband amplifier receiving the said output signals from the said plurality of voltage controlled oscillators and providing a composite output signal of the said signals from the said plurality of voltage controlled oscillators;

c. an acousto-optic Bragg cell having a coupled transducer, a determined optical aperture, and a bandwidth of operation at least equal to the sum of the said bandwidths of the said plurality of voltage controlled oscillators;

d. means for applying the output of the said broadband amplifier to the said transducer of the Bragg cell;

e. a laser providing a continuous wave beam of monochromatic coherent light;

f. a beam expanding telescope cooperating with the said laser beam expanding the said laser beam to approximately the size of the said determined optical aperture of the Bragg cell and directing the said expanded beam onto the said aperture

g. a moving photo-sensitive recording medium, photo responsive to the said monochromatic laser light;

h. a focusing telescope receiving the laser light passing through the said Bragg cell focusing the deflected laser light, formed into individual beams respective to each of the said plurality of oscillators by the said Bragg cell, onto the said moving photosensitive recording medium; and

i. an optical mask positioned within the said focusing telescope for preventing any direct beam of laser light from being emitted through the said focusing telescope.

3,900,852

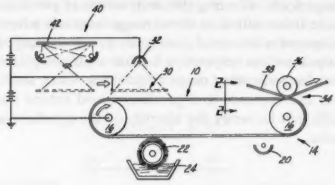
DEVELOPING METHOD FOR PLAIN PAPER COPYING

Curt Robert Raschke, Warrensville Heights, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Jan. 30, 1974, Ser. No. 438,161
Int. Cl.[2] G03G 15/16
U.S. Cl. 346—74 ES 2 Claims

1. The method of producing plain paper copies of data sheets by first toning a carrier surface and thereafter imaging, comprising the steps of:

1. providing a dielectric surface with a conducting back
2. applying a uniform electrostatic charge to said dielectric surface
3. applying a triboelectric toner in a uniform coating onto said charged dielectric surface



4. neutralizing the electrostatic charge in a pattern corresponding to said data sheet; and thereby substantially loosening said toner from said dielectric surface; and
5. physically attracting said loosened toner onto a final copy carrying sheet;

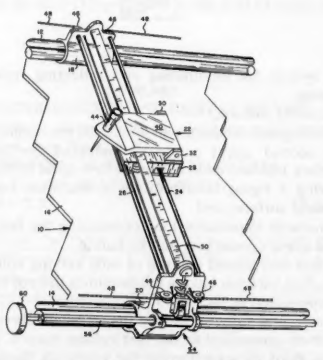
whereby, the dielectric sheet is toned and thereafter imaged as contrasted with the common methods of imaging and thereafter toning.

3,900,853

STYLUS ACTUATOR

Robert Gordon White, Portland, Oreg., assignor to Tektronix Inc., Beaverton, Oreg.

Filed May 6, 1974, Ser. No. 466,943
Int. Cl.[2] G01D 15/24
U.S. Cl. 346—139 R 3 Claims



1. In a graphic recorder having a recording element for recording information on a recording medium, a first pair of guide rods disposed adjacent a plotting surface along a first recording axis, a pair of carriage members adapted for movement along said first pair of guide rods, a second pair of guide rods mounted between said carriage members and positioned along a second recording axis orthogonal with said first recording axis, and a stylus holder slidably mounted on said second guide rods for movement over a plotting surface, said stylus holder including a pivotal plate carrying said recording element actuator comprising:

selectively actuable energizing means having first and second rotational positions;

a rotatable shaft connected to said energizing means and disposed in axial parallelism with said first pair of guide rods;

first cam means slidably mounted on said rotatable shaft and carried by one of said carriage members, said first cam means having a substantially cylindrical shape with a groove extending longitudinally along the outer surface thereof;

pivotal bar means disposed parallel to said second pair of guide rods and passing between said pivotal plate and said plotting surface, said pivotal bar means having a first rotational position about a longitudinal axis thereof for holding said recording element in a non-recording position and a second rotational position for holding said recording element in a recording position; and

coupling means operatively connected to said one of said carriage members to transmit rotational motion of said energizing means to said pivotal bar means for selectively moving said recording element in and out of engagement with said recording medium, said coupling means including pushrod means engaging said first cam means at one end thereof and said pivotal bar means at the other end thereof,

wherein said rod means rests in said groove in said first cam means in one rotatable position and on the outside wall of said first cam means in the second rotatable position so that any force exerted by said rod means upon said first cam means is directed toward the axis of said first cam means to thereby preclude torque from being applied to said first cam means and said energizing means in either of two rotatable positions thereof.

3,900,854

EXPOSURE APPARATUS FOR FORMING FLUORESCENT SCREENS OF COLOUR PICTURE TUBES

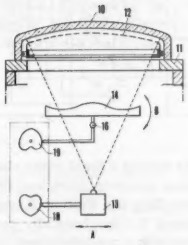
Kuniharu Osakabe, and Fumiaki Yonai, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 21, 1974, Ser. No. 444,351

Claims priority, application Japan, Apr. 6, 1973, 48-38715

Int. Cl. G03b *27/00*

U.S. Cl. 354—1 **9 Claims**



1. In exposure apparatus for forming a fluorescent screen of a colour picture tube of the type comprising means for supporting a panel of said colour picture tube, said panel being coated with a photosensitive film on the inner surface thereof, and said panel being provided with a slot type colour selection electrode on the inside thereof, an exposure light source adapted to direct exposure light to the inner surface of said panel and positioned a predetermined distance spaced apart from said inner surface, and an optically transparent body interposed between said exposure light source and said colour selection electrode for diffracting said exposure light, the improvement which comprises driving means for linearly moving said exposure light source in a plane containing an axis extending in the longitudinal direction of the slots of said colour selection electrode and for simultaneously oscillating said optically transparent body with respect to said plane.

3,900,855

EXPOSURE CONTROL SYSTEM AND METHOD

John W. Stempeck, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 12, 1973, Ser. No. 414,887

Int. Cl. G03b *7/08*

U.S. Cl. 354—29 **23 Claims**

1. An exposure control system comprising:

exposure mechanism means selectively movable between a first position in blocking relation to an exposure opening and a second position defining a given aperture value in unblocking relation to the exposure opening, said exposure mechanism means defining a progressive variation of aperture values over the exposure opening when so moved between said first and said second positions;

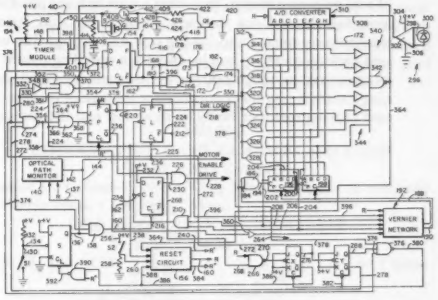
drive means energizable to effect movement of said exposure mechanism means between said first and said second position;

exposure evaluating means having an output the value of which corresponds with an exposure evaluation of a scene;

converter means responsive to said exposure evaluating means output and operative to derive a digital representation of the said value thereof; and

control means including:

counter means responsive to an input pulse train for sequentially counting the received pulses thereof and deriving a time dependent digital representation of the number of said pulses received,



means when actuated for energizing said drive means to move said exposure mechanism means toward said second position to initiate an exposure interval during which scene light rays pass through the exposure opening and then in response to coincidence between said digital representations of said counter means and said converter means for energizing said drive means to move said exposure mechanism means to block said exposure opening and terminate said exposure interval, said energizing means including generator means for deriving said pulse train input to said counter at one frequency during energization of said exposure mechanism means effecting movement thereof from said first to said second position and at another frequency during location of said exposure mechanism means in said second position so as to vary the time dependent digital representation of said counter as a function of both said variation of aperture values and said given aperture value.

3,900,856

AUTOMATIC EXPOSURE CONTROL DEVICE

Tatsuya Taguchi, Tokyo, and Yukio Iura, Yokosuka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 14, 1973, Ser. No. 369,783

Claims priority, application Japan, June 26, 1972, 47-063920

Int. Cl. G03b *9/02*

U.S. Cl. 354—45 **5 Claims**

1. An automatic exposure control device in an interchangeable lens type camera incorporating an exposure meter having an indicator therein, comprising:

means for scanning said indicator of the exposure meter, said scanning means including a movable scanning member, a stop member, and restoring spring means for said movable member;

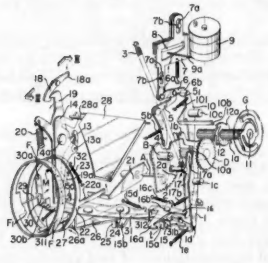
aperture control means;

drive means for said movable member of said scanning means and for said aperture control means, said drive means including means for release of said drive means from an initial position thereof and for rotation thereof in a predetermined direction upon initiation of picture taking;

a pivoted locking member shaped and disposed for locking said drive means, in one position of said locking member, by a locking engagement with said drive means, said locking member being biased by bias means for the direction of movement towards said position of locking engagement;

first mechanical transmission means for transmitting the driving force of said drive means to said aperture control means;

second mechanical transmission means for transmitting the driving force of said drive means to said movable member of said scanning means, including a rocker lever pivotably mounted on a force delivery member of said second transmission means and having one end engageable with said locking member and having pivot coupling means on its other end to which said movable member of said scanning means is pivotably coupled for linkage of movement; said locking member being so mounted and the mutually



engaging portions of said locking member and of said rocker lever being so shaped and disposed as to provide a point of rocking engagement of said rocker lever on said locking member which is necessary for maintaining force transmission capability between said rocker lever and said movable member of said scanning means and which is also effective to maintain, said locking member out of engagement with said drive means, so long as movement of said movable member is not arrested by said stop member, while said rocker lever pivots about said point of rocking engagement of said rocker lever on said locking member, said mutually engaging portions providing said rocking engagement being also shaped and disposed that upon arrest of said movable member by said stop means, said rocker lever is forced to pivot on said force delivery member of said second transmission means to disengage from and release said locking member, thereby permitting said locking member to engage with and lock said drive means and simultaneously releasing said movable member of said scanning means for restoration of its initial position by said restoring spring means of said scanning means, regardless of the position of said force delivery member of said second transmitting means.

3,900,857
FLASH SYNCHRONIZING CAMERA WITH MECHANICALLY AND ELECTRICALLY TIMED SHUTTER

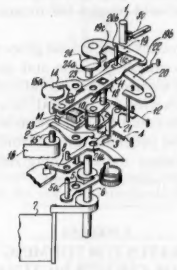
Kayoshi Tsujimoto, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

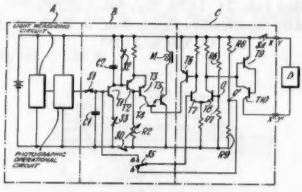
Filed Mar. 1, 1974, Ser. No. 447,446

Claims priority, application Japan, Mar. 12, 1973, 48-28673; May 12, 1973, 48-52992

Int. Cl.[2] G03B *7/08, 9/58*

U.S. Cl. 354—50 **14 Claims**





1. In a camera having a focal plane shutter, means for controlling the shutter opening operation, first control means for electrically controlling the shutter closing operation and second control means for mechanically controlling the shutter closing operation with a predetermined delay from the shutter opening operation in place of said first control means at an inoperable condition of said first control means, the combination comprising:

means changeable from a first to a second condition when a flash device is connected with said camera; switching means for causing said first controlling means to be in said inoperable condition with said changeable means in said second condition; whereby the shutter closing operation of said camera is controlled by said second control means when the camera is used with the flash device.

3,900,858
CAMERA TO MICROSCOPE ADAPTOR WITH A SPECIAL OPTICAL ELEMENT

Mary Conlin McCann, Belmont; William T. Plummer, and Vivian K. Walworth, both of Concord, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 3, 1973, Ser. No. 420,913

Int. Cl. G03b *17/48*

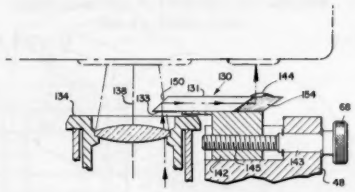
U.S. Cl. 354—79 **7 Claims**

1. An optical element intended for coupling the automatic exposure control of a photographic camera having a rectangular photographic format to an image-forming optical instrument by diverting light from at least one portion of said image that will not fit within said format to said automatic exposure control, said optical element comprising:

a first reflecting surface parallel to an edge of said format and oriented to reflect light from said optical instrument laterally with respect to said camera's optic axis;

a second reflecting surface oriented to reflect said light into said camera's automatic exposure control;

a dioptric surface, between said second reflecting surface



and said automatic exposure control, for changing the solid angle subtended by said light so as to increase the amount of said light reaching the photosensitive detector of said automatic exposure control; and

a homogeneous transparent medium through which said light travels from said first reflecting means to said dioptric surface via said second reflecting means.

3,900,859

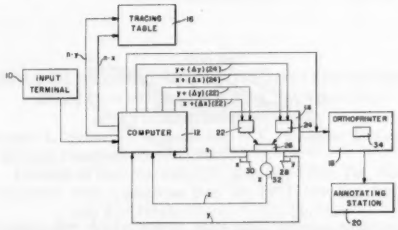
APPARATUS AND METHOD FOR OPTICAL ANNOTATION OF ORTHOPHOTOGRAPHS

Seymour Jack Friedman, Alexandria, Va., assignor to O.M.I. Corporation of America, Alexandria, Va.

Filed Jan. 15, 1974, Ser. No. 433,535

Int. Cl. G03b *17/24*

U.S. Cl. 354—109 **3 Claims**



1. An orthophotographic printer for producing annotated orthophotographs comprising, in combination:

a. a first photocarriage for supporting an aerial photograph with inherent distortions therein,

b. means for translating said first photocarriage in a first and a second plane,

c. a second photocarriage for supporting sensitized recording film,

d. means for translating said second photocarriage in a first and a second plane, said planes being spaced from, but parallel to, the planes within which said first photocarriage is translated,

e. an optical transmission train for optically rectifying the inherent distortions in the aerial photograph while projecting images from said photograph onto the recording film, said optical transmission train including:

1. a first light source and a first lens with a narrow scanning slit positioned above the aerial photograph to illuminate selected portions thereof and thus project images therefrom through said first photocarriage and toward said sensitized recording film, and

2. an exposure mask with a narrow slit positioned above said sensitized recording film to allow the projected images to expose only selected areas of te sensitized recording film as the first and second photocarriages are translated relative to one another,

f. means for optically annotating the orthophotograph as same is produced on the recording film by successive exposures, said means comprising:

1. projection means disposed in operative relationship to said optical transmission train,

2. a series of transparencies with distinct cartographic images retained within said projection means,

3. a second light source and a second lens positioned in alignment with said projection means for illuminating said transparencies and projecting the cartographic images from said transparencies toward said optical transmission train, and

4. mirror means positioned within said optical transmission train at an acute angle to the images illuminated by said first and second light sources and projected by said first and second lenses, and

5. said mirror means reflecting the images of the transparencies illuminated by said second light source onto said exposure mask positioned above said sensitized recordng film while permitting the image of the selected portion of the aerial photograph illuminated by said first light source to fall onto said exposure mask.

3,900,860

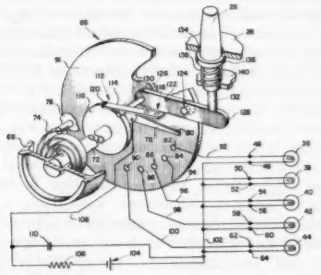
PHOTOGRAPHIC CAMERA AND FLASH LAMP SELECTION SYSTEM

Walter G. Lehmann, Somerville, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1973, Ser. No. 427,812

Int. Cl. G03b *15/03*

U.S. Cl. 354—126 **44 Claims**



42. A photographic camera operable in conjunction with an array of flash lamps for effecting artificially illuminated photographic exposures, the array of flash lamps including a pair of input terminals in electrical communication with each flash lamp thereof, said camera comprising:

means for initiating a photographic exposure cycle;

means for mounting the array of flash lamps and a source of electrical energy; and

means for firing the flash lamps in a predetermined sequence with one flash lamp only being fired responsive to each operation of said exposure cycle initiating means, said firing means including:

means for sequentially coupling each pair of the input terminals to the source of electrical energy to facilitate the sequential firing of the flash lamps, said sequentially coupling means including a displaceably mounted electrical contact member arranged to sequentially couple the source of electrical energy to the pairs of input terminals;

means responsive to the operation of said exposure cycle initiating means for rendering said sequentially coupling means operative; and

means responsive to the firing of each of the flash lamps for rendering said sequentially coupling means inoperative to effect the firing of the next unfired flash lamp, whereby each operation of said exposure cycle initiating means will effect only the firing of the first unfired flash lamp in the array and the next operation of said exposure cycle initiating means will effect the firing of the next unfired flash lamp in the array.

3,900,861

CAMERA FOR MICROPHOTOGRAPHY

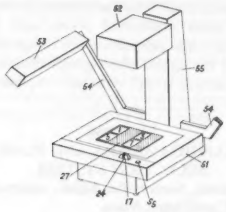
Gert-Rudiger Aust; Siegfried Hainy, and Erich Korf, all of Dresden, Germany, assignors to VEB Pentacon, Dresden, Germany

Filed Oct. 9, 1973, Ser. No. 404,253

Claims priority, application Germany, Nov. 8, 1972, 316680; Germany, Jan. 13, 1973, 2301731; United Kingdom, June 29, 1973, 15270/73

Int. Cl. G03b *19/02*

U.S. Cl. 354—209 **3 Claims**



1. In a microfilm camera having a housing enclosing a camera shutter and an intermittently movable film transport mechanism including a transport motor, and a switch device operable by said shutter, the provision of a change-over switch connected in series with the film transport switch and movable between one position for "overall exposure" and another position for "partial exposure" of the film format, the circuit through the transport motor being completed to transport the film with the change-over switch in the "overall exposure" position when the transport switch is actuated by the shutter while the circuit though the transport motor is open with the change-over switch in the "partial exposure" position and wherein there is provided in said camera housing a counter mechanism, comprising a step-wise movable counting member, means for moving said counting member by one step upon each successive operation of the shutter with said change-over switch in the "partial exposure" position and a trip cam on said counting member for actuating said change-over switch into the "overall exposure" position upon the last desired operation of the shutter with said change-over switch in the "partial exposure" position, said means for moving said counting member being operated electromagnetically and connected in series with said transport switch by way of said change-over switch.

3,900,862

DEVELOPING APPARATUS FOR PHOTOCOPY MACHINES

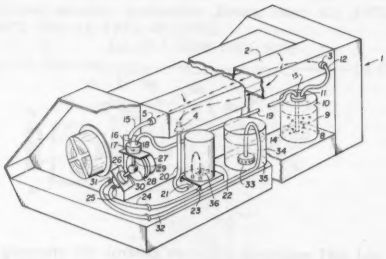
Frank Prescott Bennett, Northbrook, Ill., and Eduard Feitzinger, Vestal, N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Apr. 25, 1974, Ser. No. 464,123

Int. Cl.[2] G03D *7/00*

U.S. Cl. 354—300 **17 Claims**

1. A developing apparatus for photocopy machines comprising, in combination, a developing chamber having an inlet for receiving developing medium, an outlet for discharging said developing medium, and means for transporting sensitized paper therethrough in the line of flow of developing medium from the inlet to the oulet; means for introducing developing medium into said developing chamber in controlled amounts via said inlet; and a vacuum pump in communication with said outlet to remove said developing medium



from the developing chamber; said vacuum pump being adapted to pump a greater volume of developing medium from said developing chamber than is introduced thereto, to maintain the internal pressure of said developing chamber at below atmospheric, and thereby avoid external leakage of developing medium.

3,900,863

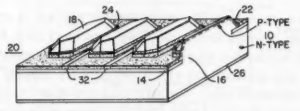
LIGHT-EMITTING DIODE WHICH GENERATES LIGHT IN THREE DIMENSIONS

He B. Kim, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 13, 1974, Ser. No. 469,588

Int. Cl.[2] H01L *29/61*; **H01S** *33/19*; **H01L** *29/06, 29/04*

U.S. Cl. 357—17 **6 Claims**



1. A light-emitting solid-state device which will generate light proximate a plurality of different surfaces which are in more than one plane, said device comprising:

a. a substrate formed of predetermined n-type material having a selected surface of predetermined crystallographic orientation;

b. a thin layer of inorganic dielectric material adhered over said selected surface of said substrate, said thin layer having provided therein at least one aperture of predetermined size and configuration and positioned in predetermined crystallographic orientation with respect to said selected surface;

c. an epitaxial facet grown island of said n-type material extending from said substrate and projecting a predetermined distance through and beyond the aperture in said dielectric layer;

d. a thin p-type layer overlaying the portions of said island which project beyond the aperture in said dielectric layer, with the boundary between said n-type material and said p-type layer defining a multiplanar light-emitting p-n junction;

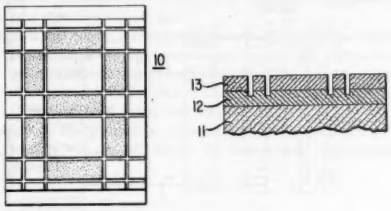
e. first metallic electrode means contacting said p-type layer; and

f. second metallic electrode means contacting another surface of said substrate.

3,900,864
MONOLITHIC LED DISPLAYS

Paul Daniel Dapkus, Bernardsville; Richard Wayne Dixon, Morristown, and Walter Werner Weick, Somerville, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 361,252, May 17, 1973. This application Oct. 9, 1973, Ser. No. 404,599
Int. Cl. H05b *33/00*
U.S. Cl. 357—18 7 Claims

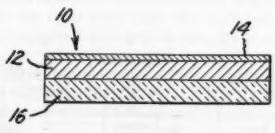


1. A light-emitting diode display device comprising a planar indirect band gap semiconductor chip, a large area, essentially planar, p-n junction formed within a major portion of the surface of the chip, a multiplicity of grooves formed into said major portion of the surface of the chip with a depth below the p-n junction and greater than the width of the grooves, each of said grooves defining an island on the chip and the islands defining the active light-emitting regions of the display, the said grooves providing a means for more effectively isolating the light-emitting regions, and electrical contacts to the islands and to the layer of the p-n junction remote from the surface.

3,900,865
GROUP III-V COMPOUND PHOTOEMITTERS HAVING A HIGH QUANTUM EFFICIENCY AND LONG WAVELENGTH RESPONSE

Donald L. Schaefer, Skaneateles, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 846,155, July 30, 1969, Pat. No. 3,672,992. This application Dec. 10, 1971, Ser. No. 206,947
Int. Cl.[2] H01L *27/14*, *31/00*, *29/161*
U.S. Cl. 357—30 2 Claims

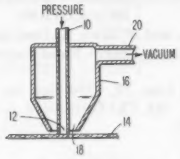


1. A photoemitter with an improved infrared response comprising a semiconductive layer of a Group III-V compound having a bandgap equal to a desired photoelectric threshold, a 10–100A thick film of a second III-V compound atop said substrate, said second III-V compound nominally having a bandgap wider than the bandgap of said underlying layer, and electropositive metal ions absorbed within the surface of said film in an amount sufficient to lower the surface work function of said film to the desired photoelectric threshold.

3,900,866
APPARATUS FOR AND METHOD OF GRAPHICAL RECORDING

Barry A. Bell, Glenside, and Edward L. Weiss, Quakertown, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Continuation-in-part of Ser. No. 270,327, July 10, 1972, Pat. No. 3,793,638. This application Feb. 11, 1974, Ser. No. 441,204
Int. Cl. G01d *15/16*
U.S. Cl. 346—1 19 Claims

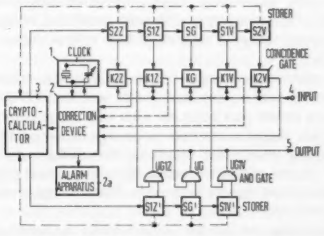


1. A method of applying ink to a record receiving medium comprising the steps of:
directing a fountain of ink toward said record receiving medium through a discharge port;
contacting said record receiving medium at a selected area with said fountain of ink; and
evacuating the area substantially surrounding said discharge port through a vacuum port so as to confine the fountain of ink to said selected area and remove said ink after contact with said record receiving medium, said selected area having a diameter substantially smaller than the inside diameter of said vacuum port.

3,900,867
INTERROGATOR-RESPONSOR SYSTEM FOR DIFFERENT INTERROGATOR CODES

Gerhard Wagner, Schaftlach, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Continuation-in-part of Ser. No. 110,888, Jan. 29, 1971, abandoned. This application Feb. 9, 1973, Ser. No. 331,173
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.5 LC 12 Claims



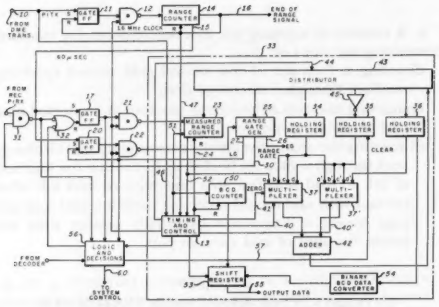
1. In an interrogation-answer system for secondary radar with time dependently changed codes which are transmitted successively in time by an interrogation apparatus and at least one answering apparatus having means for receiving an interrogation code and means producing and storing therein the time-dependent program of the interrogation codes to be expected from the interrogation apparatus and providing time-dependent answering codes which are related in such a predetermined manner to the interrogation codes that for each one of the interrogation codes one predetermined answer code is transmitted to the interrogation apparatus, the interrogation apparatus and the answering apparatus each having a clock connected thereto and operable to provide the same time standard for controlling the code sequence, the answering apparatus comprising means storing codes repre-

senting past, present and future time as respective past, present and future interrogation codes, means connected to said storage means for comparing the received interrogation code with the past, present and future codes to determine lead or lag of the answering apparatus time standard with respect to that of the interrogation apparatus, and means connected to said comparing means and to said clock of said answering apparatus for correcting the production of the time dependently changed codes in the answering apparatus.

3,900,868
APPARATUS AND METHOD FOR PULSE TRACKER RANGING EQUIPMENT WITH INCREASED RESOLUTION

Joseph J. Bock, and William S. Dunham, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 22, 1974, Ser. No. 453,613
Int. Cl.[2] G01S *9/14, 9/56*
U.S. Cl. 343—7.3 **36 Claims**



1. In a digital pulse tracker ranging system having a transmitter-receiver for transmitting pulses to an object and receiving corresponding return pulses from said object, respectively, said system including apparatus for predicting the ranges from said transmitter-receiver with respect to said object for said transmitted pulses to provide digital predicted range signals, respectively, said range predicting apparatus comprising

range gate generating means for generating range gate pulses in accordance with said predicted ranges at the expected times of receipt of said return pulses, respectively,

range measuring means for measuring the transit times between said transmitted pulses and said corresponding return pulses that coincide with said range gate pulses to provide digital measured range signals, respectively,

subtracting means for obtaining the differences between said digital measured range signals and said digital predicted range signals to provide digital range error signals, respectively,

accumulating means for algebraically accumulating said digital range error signals to provide the algebraic sum thereof,

first multiplying means for multiplying the latest generated of said digital range error signals by a first number of absolute value less than unity to provide additional digits of resolution thereby providing a current range error signal,

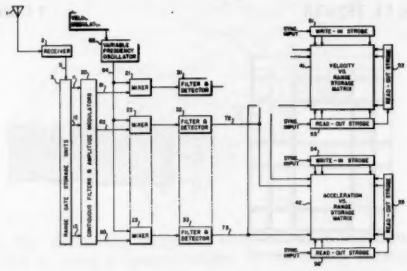
second multiplying means for multiplying said accumulated sum of said digital range error signals by a second number of absolute value less than unity to provide additional digits of resolution thereby providing an accumulated range error signal, and

summing means for obtaining the algebraic sum of the latest of said predicted range signals, said current range error signal and said accumulated range error signal to provide the next of said predicted range signals.

3,900,869
RADAR SIGNAL ANALYZING SYSTEM

Garold K. Jensen, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 27, 1967, Ser. No. 650,157
Int. Cl.[2] G01S *9/42*
U.S. Cl. 343—7.7 **11 Claims**



1. In a moving target detection apparatus, a system for analyzing a sequence of signals whose amplitude envelope varies with the doppler information derived from a moving target, said system comprising:

means to store said sequence of signals,

means to repeatedly read out said stored signals during a plurality of equal duration readout intervals,

means to produce a succession of analyzing signals each having a duration equal to one of said readout intervals, means to stepwise vary the frequencies of said succession of analyzing signals,

means to continuously vary the frequencies of said succession of analyzing signals,

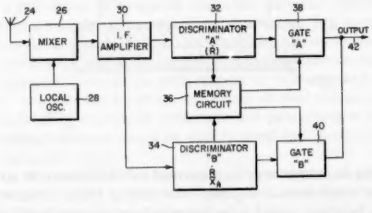
means to mix said repeatedly readout signals with said succession of frequency signals; and

filter means to receive the output from said mixer means and to pass a signal whenever the instantaneous frequency of the readout signals differs from the instantaneous frequency of the analyzing signals by a frequency which is passed by said filter.

3,900,870
ELECTRONIC COUNTER-COUNTERMEASURES SYSTEM FOR EMPLOYMENT AGAINST ENEMY JAMMING

Owen F. Foin, Jr., Fresno, and Frank P. Miley, Camarillo, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 5, 1965, Ser. No. 477,620
Int. Cl.[2] G01S *9/46;* **H04K** *3/00*
U.S. Cl. 343—7 A **7 Claims**



1. In signal processing apparatus of the type wherein a signal is radiated from a source toward a moving target, with the energy reflected therefrom then being received at a third point as a Doppler signal and utilized to provide an indication as to the location of such target, the latter being provided with means for receiving the radiated signal from said source and

transmitting energy to said third point in the form of a false Doppler signal which differs in character from the true Doppler signal and is intended to provide an erroneous indication as to the actual location of said target, the combination of:

means at said third point for receiving the energy arriving from said target;

a first discriminator having a predetermined response rate; a second discriminator having a response rate different from that of said first discriminator;

means for applying to both of said discriminators the energy received from said target;

a pair of gating units connected to the respective outputs of said discriminators; and

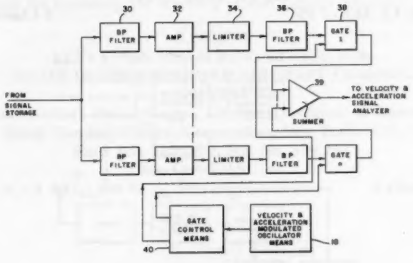
means, including a memory network connected to both said discriminators, for controlling the circuit status of said gating units in accordance with the reception by said two discriminators of either a true Doppler signal or a false Doppler signal from said target,

whereby the indication provided as to the location of said target will at all times be accurately representative thereof.

3,900,871
CONTIGUOUS FILTER TRACKING WINDOW FOR RADAR

Garold K. Jensen, Alexandria, Va., and James E. McGeogh, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 11, 1971, Ser. No. 154,237
Int. Cl.[2] G01S 9/44
U.S. Cl. 343—8 **2 Claims**



1. A contiguous filter covering a given bandwidth of doppler frequencies and separated into a set of *n* contiguous channels which divide the total bandwidth into narrower bandwidths equal to the doppler bandwidth divided by *n*, each channel comprising, in combination:

bandpass filter means having a bandwidth larger than the doppler frequency divided by *n*;

gating means connected to receive the output of said bandpass filter;

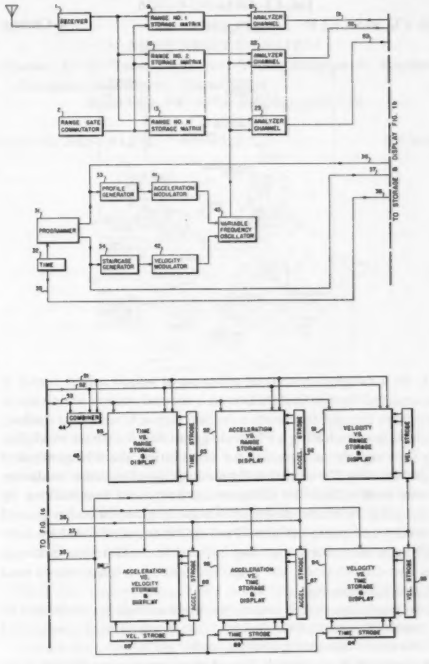
gate control means connected to said gating means for producing enabling signals for opening said gating means to permit signals to be passed therethrough; and

velocity-and-acceleration modulated oscillator means connected to said gate control means for controlling the production of said enabling signals so that the gating means in said set of contiguous channels are opened and closed serially with no time overlap, each gating means being opened only for the time taken by the velocity-and-acceleration modulated signal to completely sweep the dopplerbandwidth-divided-by-n bandwidth of that particular gating means' associated filter.

3,900,872
RADAR DATA CONVERTER AND DISPLAY SYSTEM

Garold K. Jensen, Alexandria, Va., and James E. McGeogh, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 27, 1967, Ser. No. 649,794
Int. Cl.[2] G01S 9/44
U.S. Cl. 343—9 **11 Claims**



1. A radar system comprising:

receiver means for receiving radar echo signals and providing on a plurality of output lines doppler signals related in frequency to the movement of distant objects with each one of said output lines carrying doppler signals derived from a different one of a plurality of predetermined range intervals;

oscillator means whose output is stepped repetitively through a sequence of different constant frequencies and varying frequencies which vary at different rates;

analyzer means connected to said plurality of output lines and to said oscillator means to produce on a plurality of analyzer output lines analyzer signals whenever said doppler signals differ in frequency from the frequency of said oscillator signals by predetermined amounts with each of said analyzer output lines carrying analyzer signals derived from a different one of said plurality of predetermined range intervals;

a two-dimensional storage matrix comprising a plurality of storage elements connected to store the signals appearing on said analyzer output lines;

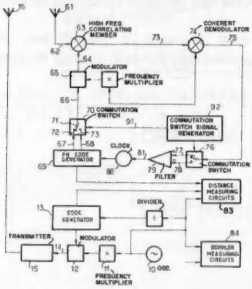
strobing means connected to said storage matrix to sequentially gate open said storage elements in unison with the stepping of said oscillator output; and

a two-dimensional array of display devices associated with said storage matrix with each of said display devices connected to a different one of said plurality of storage elements to indicate when a signal is stored in said storage element.

3,900,873
INSTALLATION FOR MEASUREMENT BY RADIO-ELECTRIC TRANSMISSION OF A DISTANCE BETWEEN TWO STATIONS

Pierre Bouvier, Suresnes, and Max Schumperli, Vaucresson, both of France, assignors to Electronique Marcel Dassault, Paris, France

Filed July 30, 1973, Ser. No. 383,568
Claims priority, application France, Aug. 2, 1972, 72.27890
Int. Cl. G01s *9/24, 9/56*
U.S. Cl. 343—12 R **4 Claims**



1. In a ranging system of the type in which a first signal is transmitted from a first station to a second station which upon reception thereof transmits a second signal to said first station, each station including a PN code generator for phase modulating said signals and means for correlating the PN generated code with the PN modulated received signal in order to derive at said first station the distance between said two stations by generating the correlations of two successive PN codes spaced apart by one period of the PN code bit sequence and by controlling a delay-lock tracking loop by the difference between said two correlations, the improvement at at least one of said stations comprising,

commutation switch means having two inputs connected to said PN code generator and one single output connected to said correlating means, and

a commutation switch signal generator operatively connected to said commutation switch means, whereby the PN modulated received signals are successively and alternately correlated with said successive PN codes locally generated at said one station.

3,900,874
DIVERSITY COMBINATION OF RADAR SIGNALS

Robert S. Larkin, Denville; Nean K. Lund, and Charlton E. Williams, both of Berkeley Heights, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 27, 1963, Ser. No. 268,488
Int. Cl.[2] G01S *3/30, 9/02*
U.S. Cl. 343—16 R **6 Claims**

2. In an information processing system having a plurality of input conductors carrying individual signals of which at most two are at any instant principal signals, the others being spurious, the identities of said principal signals changing from instant to instant,

and having means for utilizing said principal signals,

apparatus for rejecting spurious signals which comprises,

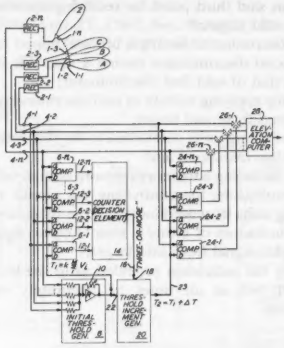
means for continuously additively combining all of said signals to develop a reference threshold of a magnitude in excess of the majority of said signals,

means for comparing each individual signal with said reference threshold to develop an indication for each signal which exceeds said threshold,

means for counting the indications thus developed,

means for developing a control signal in response solely to a count of three-or-more indications,

means responsive to said control signal for developing a threshold increment,

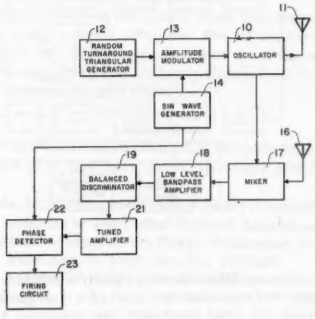


and means for passing to said utilization means only those video signals that exceed said threshold and said threshold increment.

3,900,875
FM-CW FUZE SYSTEM

David F. Scheets, Corona, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 29, 1961, Ser. No. 99,320
Int. Cl.[2] F42C *13/04*
U.S. Cl. 343—7 PF **5 Claims**

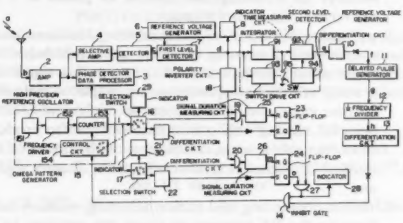


2. In a fuze system the combination comprising: a random turnaround triangular generator having an output; an amplitude modulator having a first input coupled to the output of said triangular generator a second input and an output; a low frequency sin wave generator having an output coupled to the second input of said modulator; a transmitting antenna; an oscillator having an input coupled to the output of said modulator and an output coupled to said transmitting antenna; a mixer having first and second inputs and an output; a receiving antenna coupled to the first input of said mixer, the second input of said mixer being coupled to the output of said oscillator; a low level amplifier having an input coupled to the output of said mixer and having an output; a firing circuit having an input; a phase detector having a first input coupled to the output of said low level amplifier, a second input coupled to the output of said sin wave generator and an output coupled to the input of said firing circuit.

3,900,876
AUTOMATIC OMEGA SIGNAL PATTERN SYNCHRONIZING SYSTEM

Kazuo Tsukada, Kakogawa; Mitsuru Sunagawa, Himeji, and Yoshiharu Kanzaki, Akashi, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed July 11, 1973, Ser. No. 378,312
Claims priority, application Japan, July 11, 1972, 47-69400
Int. Cl.[2] G01S 1/30
U.S. Cl. 343—105 R **5 Claims**

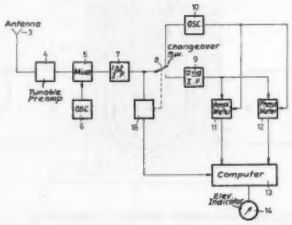


1. An automatic omega signal pattern synchronizing system comprising detection means responsive to a received signal for providing a first output indicative of a received signal above a predetermined level and a second output indicative of the received signal above a predetermined level also having a predetermined duration, a pattern generator producing an output signal, means responsive to the second output of said detection means for resetting said pattern generator, and means for detecting the time difference between said first output of said detection means and the output signal of said pattern generator and producing an inhibit output signal when the output signal of said pattern generator is synchronized with the received signal within a predetermined time difference for inhibiting the resetting of said pattern generator.

3,900,877
ELEVATION MEASURING DEVICE FOR PHASE-INTERFEROMETER AIRCRAFT LANDING SYSTEM

Karl Kohler, Heimerdingen, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 16, 1973, Ser. No. 379,251
Int. Cl.[2] G01S 1/44
U.S. Cl. 343—108 M **5 Claims**



1. In an air navigation system, a device for air-derivation of elevation angle of an airborne receiver, with respect to a ground beacon array transmitting R.F. pulses of equal magnitude and phase cyclically and successively from a commutated linear array of N equally spaced radiator elements, said system further including a reference pulse for identifying the beginning of a cycle of commutation at said ground beacon and for providing a phase and amplitude standard in said receiver, the combination comprising:

means within said receiver for measuring the phase and amplitude of the pulses corresponding to a first sub-group of successive ones of said radiator elements and of a second sub-group of said radiator elements to provide a corresponding pair of sets of phase and amplitude values;

means within said receiver for modifying the phase and amplitude of received energy of each pulse in each of said groups to simulate a directive beam scanning pattern of received energy;

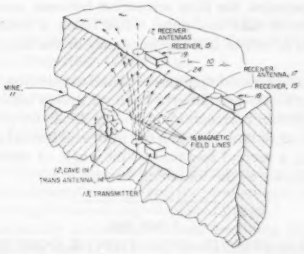
means for determining the vector sum of said pulses within each of said sets on a pulse-to-pulse basis;

and means for deriving the phase difference of the two vector sums corresponding to said sub-groups, said phase difference representing a measure of elevation angle.

3,900,878
MINE RESCUE SYSTEM

Carson K. H. Tsao, Braintree, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 14, 1973, Ser. No. 332,532
Int. Cl. G01s 3/02
U.S. Cl. 343—112 R **8 Claims**



1. In combination:

means for transmitting a signal through a region of earth, said signal having a frequency below 3 kHz, said transmitting means being located beneath the surface of the earth; means for determining the position upon the surface of the earth below which lies said signal transmitting means comprising:

first and second means for receiving said signal upon the surface of the earth, said second receiving means being movable with respect to said second receiving means;

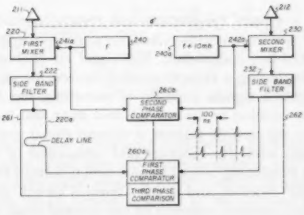
means for comparing the phase of said signal as received at said first receiving means with the phase of said signal as received at said second receiving means; and

means for determining the position upon the surface of the earth where the phase of said signal as received at said second receiving means is at a maximum lead over the phase of said signal as received at said first receiving means.

3,900,879
ELECTRONIC COUNTERMEASURES SYSTEM

Lewinter, Sidney W., West Orange, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Apr. 11, 1968, Ser. No. 720,674
Int. Cl.[2] G01S 3/48
U.S. Cl. 343—113 R **6 Claims**



1. A system for measuring the angle of arrival and the frequency of a radiated wave with respect to a defined line, comprising in combination,

a. first and second input terminals for receiving said radiated wave defining points of arrival and said defined line;
b. first and second local frequency oscillator means for supplying first and second preset different frequencies separated by a predetermined number of herz in the frequency spectrum;
c. first and second mixers receiving said respective first and second inputs from said input terminals and said local oscillator means providing first and second beat frequencies;
d. first and second filter means included with said first and second mixers to select as output predetermined frequency components of said beat frequencies;
e. a first phase comparator coupled to said first and second mixers providing a first train of pulses separated by a time corresponding to the difference in the local frequencies;
f. a second phase comparator coupled to said first and second local oscillators also providing a train of pulses separated by a difference corresponding to the local frequencies, the time separation between corresponding pulses in said two pulse trains being a function of the angle of arrival and the frequency of the incoming wave; and,
g. a third phase comparator coupled to said first and second mixers also providing a train of pulses separated by a difference corresponding to the local frequencies, the time separation between the third and second pulse trains being a second function of the angle of arrival and the frequency of the incoming wave.

3,900,880

WIRELESS REMOTE OPERATION OF AN RF RECEIVER

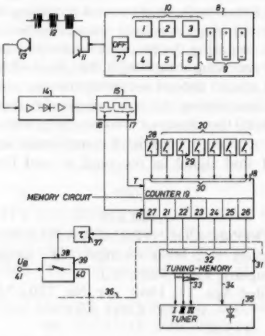
Wolfgang Fleischer, and Kurt Knuth, both of Hannover, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Dec. 5, 1973, Ser. No. 421,993

Claims priority, application Germany, Dec. 6, 1972, 2259562

Int. Cl. H04b *1/06*

U.S. Cl. 343—228 **10 Claims**



1. In a system for the wireless remote control of an RF receiver which can be switched between a switched-off state, a switched-on, operational, state, and an enabled state, the system including a remote control device for generating remote control signals capable of switching the RF receiver from the enabled to the operational state and tuning the receiver to the desired station, a control signal processing unit associated with the receiver and composed of a switching memory producing output signals which control the operation of the RF receiver and a state control switch connected to switch the receiver between its operational state and enabled state, and a remote control signal receiver connected to deliver the remote control signals to the memory, the improvement wherein:

a. said remote control device comprises
1. a plurality of station selector members each associated with a respective station to be selected, and
2. transmitter means connected to be controlled by actuation of any one of said selector members for transmitting a remote control signal containing a number of pulses determined by the selector member which is actuated and corresponding to the selected station; and
b. said switching memory comprises
1. counter means connected to said remote control signal receiver for counting the number of pulses in a received remote control signal,
2. a plurality of station selecting memory locations and a state selecting memory location, each switchable between a state in which it produces no output signal and a state in which it produces an output signal, said counter means being connected to said memory locations for causing only one of said locations to produce an output signal upon completion of the count of the number of pulses in a received remote control signal, and
3. means connecting said station selecting memory locations to the RF receiver to cause the receiver to be tuned to the selected station in response to an output signal from the corresponding station selecting memory location, and connecting said state selecting memory location to said state control switch for causing the receiver to be switched from its enabled state to its operational state when said state selecting memory location is switched into the state in which it produces no output signal.

3,900,881

NEGATIVE RESISTANCE DEVICE AND METHOD OF CONTROLLING THE OPERATION

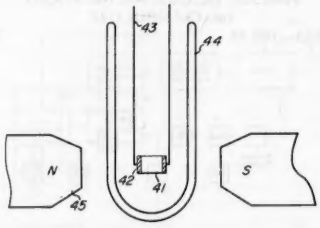
Yoshifumi Katayama, Hachioji; Nobuo Kotera, Kokubunji; Yoshimasa Murayama, Kodaira, and Isao Yoshida, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 18, 1971, Ser. No. 172,773

Claims priority, application Japan, Aug. 19, 1970, 45-72038; Mar. 5, 1971, 46-11265

Int. Cl. H01l *3/12*; H03b *15/00*

U.S. Cl. 357—3 **7 Claims**



2. A negative resistance device comprising:
a body of material having multi-valley energy bands, wherein at least two valleys are degenerate; and
means for converting said degenerate valleys into non-degenerate valleys, with the separation from the bottom of a high-energy valley to the bottom of a low energy valley exceeding the thermal energy corresponding to the ambient temperature of the material of said body by a predetermined amount, so as to make the mobility of an electron in a lower energy band high and the mobility in a higher energy band low,
wherein said converting means comprises means for applying a magnetic field to said body of material in a direction in lattice space corresponding to a direction in the pseudomomentum space of the body of material, said

direction in pseudomomentum space being non-symmetrically disposed with respect to said at least two valleys, said magnetic field being sufficiently intense to provide said valley separation, and means, coupled to a pair of opposite surfaces of said body of material, for applying an electric field sufficiently intense that said body will exhibit a negative resistance characteristic.

3,900,882

PHOTOCONDUCTOR ELEMENT

Masakazu Fukai, Nishinomiya; Shinji Fujiwara, Toyonaka; Hiroyuki Serizawa, Katano; Osamaru Eguchi, Higashiosaka; Yukimasa Kuramoto, Takarazuka, and Takao Chikamura, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 29, 1974, Ser. No. 456,240

Claims priority, application Japan, Mar. 30, 1973, 48-37179; Aug. 7, 1973, 48-88025; Sept. 18, 1973, 48-105733

Int. Cl. H01l *15/00*

U.S. Cl. 357—30 **6 Claims**

1. A photoconductor element primarily consisting of $(Zn_{1-y}Cd_yTe)_{1-z}$ $(In_2Te_3)_z$, wherein $0 < y < 1$, $0 < z < 1$.

3,900,883

PHOTOCONDUCTIVE CELL MATRIX ASSEMBLY

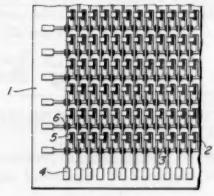
Nobuo Hasegawa, Uji; Toshio Yamashita, Katano, and Saburo Kitamura, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sept. 28, 1973, Ser. No. 401,605

Claims priority, application Japan, Oct. 2, 1972, 47-99344

Int. Cl. H01l *5/00*

U.S. Cl. 357—32 **6 Claims**



1. A photoconductive cell matrix assembly comprising a ceramic substrate having islands of photoconductive layers formed thereon, a pair of electrodes secured to each of said islands, first common lines connecting one of the electrodes on said photoconductive layers and extending in the X axis direction of the matrix and second common lines connecting the other of the electrodes on said photoconductive layers and extending in the Y axis direction of the matrix, said first and second common lines forming an X–Y matrix network, wherein each of said first and second common lines forms a three-dimensional crossing having interposed therebetween an insulating layer of a resin of an epoxy family containing at least one of the group consisting of quartz sand and alumina fine powder as a filler at each of the crossing portions.

3,900,884

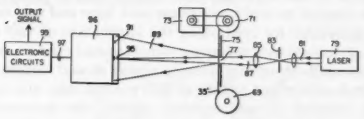
HOLOGRAPHIC COLOR TELEVISION RECORD SYSTEM

Daniel S. St. John, Hockessin, Del., assignor to Holotron Corporation, Wilmington, Del.

Division of Ser. No. 884,078, Dec. 11, 1969, Pat. No. 3,813,685. This application Mar. 26, 1974, Ser. No. 454,923

Int. Cl.² H04N *9/02*

U.S. Cl. 358—2 **7 Claims**



1. A player for a hologram record constructed of color information with at least one component thereof modulated onto a carrier frequency, comprising;

a monochromatic and spatially coherent light beam source,

means for holding said hologram record in the path of said light beam, thereby to reconstruct a monochromatic image of said modulated color information in a diffracted light beam,

means positioned in said diffracted light beam for receiving said monochromatic image and for producing at least one time varying electronic signal of said image,

means electrically connected to said receiving means for demodulating said at least one electronic signal,

means electrically connected to said demodulating means to form a composite electrical signal appropriate for driving a color cathode ray tube apparatus for displaying said color information thereon.

3,900,885

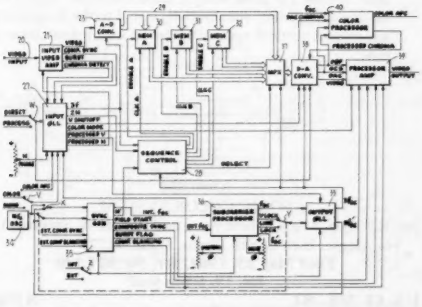
TELEVISION SIGNAL TIME BASE CORRECTOR

Michael W. Tallent; William B. Hendershot, both of San Jose; Allan L. Swain, Palo Alto, and Ronnie M. Harrison, San Jose, all of Calif., assignors to Consolidated Video Systems, Santa Clara, Calif.

Filed May 23, 1974, Ser. No. 472,761

Int. Cl. H04n *9/02*

U.S. Cl. 358—8 **46 Claims**



1. In a video signal processing system for removing time base errors from video type information signals, said system having an input terminal adapted to be coupled to said information signals, input means adapted to be coupled to said input terminal and having a plurality of output terminals; an input phase lock loop unit having a plurality of input terminals coupled to said input means and a plurality of output termi-

nals, said unit including means for generating input clock reference signals having a variable rate dependent upon said time base errors in said information signals; means for sampling said information signals at a rate determined by said input clock reference signals, said sampling means having a control input coupled to said input phase lock loop p; memory means coupled to said sampling means for temporarily storing said sampled signals at a rate determined by said input clock reference signals; an output clock generator for generating output clock reference signals having a second rate; sequencer means coupled to said input phase lock loop and said output clock generator for controlling the application of said input and said output clock reference signals to said memory means to sequentially store said sampled signals at said variable rate and fetch said stored signals at said second rate; and output means coupled to said memory means; the improvement wherein said input phase lock loop unit includes control signal generating means for generating a control signal having a magnitude dependent upon the phase difference between a reference signal train and a predetermined portion of said information signals, and generating means having a control signal input coupled to said control signal generator means for generating a reference signal train having a frequency dependent upon the magnitude of said control signal;

said generating means including first means for generating a first reference signal train having a frequency substantially equal to the repetition rate of a previously received one of the horizontal sync and equalizer pulse portions of said information signals, and second means for generating a second reference signal train having a predetermined frequency substantially equal to the frequency of the previously received burst portion of said information signals;

said control signal generating means including a first comparator means for generating a first control signal having a magnitude dependent upon the phase difference between said first reference signal train and a subsequently received one of said horizontal sync and equalizer pulse portions of said information signals, and a second comparator means for generating a second control signal having a magnitude dependent upon the phase difference between said second reference signal train and a subsequently received burst portion of said information signals; first selector means for enabling operation of said second reference signal train generating means and said second comparator means when said information signals comprise direct color video signals, said selector means including means for generating first and second mode signals specifying direct and process mode respectively; and third means for generating a third reference signal train having a frequency substantially equal to the frequency of successive vertical sync portions of said information signals.

3,900,886

SONIC COLOR SYSTEM

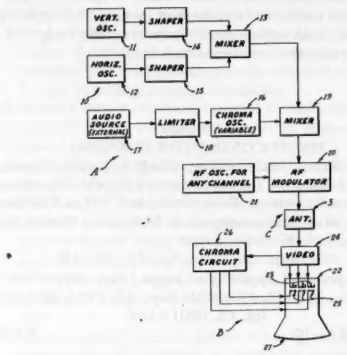
Jan R. Coyle, 514 E. Ghent Ave., and Robert W. Stevens, 1727 Via Alegre, both of San Dimas, Calif. 91773

Filed May 23, 1969, Ser. No. 827,248

Int. Cl. H04n *9/02*

U.S. Cl. 358—82 **8 Claims**

1. In a sonic color system, the combination of color receiver means having a luminescent screen, electron guns for exciting said screen to produce color patterns on said screen, video circuit means and chroma circuit means connected to the cathodes and grids of said electron guns, antenna means for picking up signals and connected to said circuit means to control said electron guns, and sonic signal responsive means connected to said antenna means and including a chroma oscillator and a RF oscillator, one of said oscillators being variable to produce a variable phase signal depending on the



sonic signal for controlling said circuit means to produce color patterns on said screen.

3,900,887

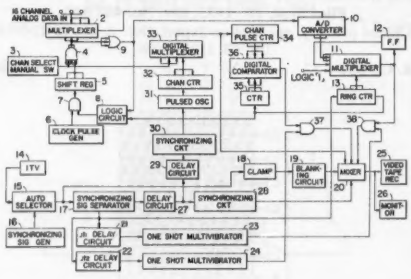
METHOD OF SIMULTANEOUS MULTIPLEX RECORDING OF PICTURE AND DATA AND OF REGENERATING SUCH RECORD AND APPARATUS THEREFOR

Hiromu Soga; Katsuhiro Minamida, both of Tokyo; Kazuo Kurasawa, and Masatake Ii, both of Hamamatsu, all of Japan, assignors to Nippon Steel Corporation, Tokyo and Hamamatsu TV Co., Ltd., Hamamatsu, both of, Japan

Filed Jan. 18, 1973, Ser. No. 324,789

Int. Cl. H04n *5/78*

U.S. Cl. 360—18 **10 Claims**



1. A method of simultaneous multiplex recording of picture and multichannel data, which comprises: converting multichannel data serially into digital signals by a multiplexer and an analog to digital converter; synchronizing digital signals converted by said analog to digital converter with horizontal synchronizing signals separated from video signals issued from a television camera; and inserting said digital signals as pulses corresponding to the digital value "0" or "1", so as to have digital signals appear when the synchronized digital signals synchronize with said horizontal synchronizing signals delayed by a certain length of time, into a blanked space right after said horizontal synchronizing pulses of said video signals, thereby recording multichannel data together with a picture on a video tape recorder.

3,900,888

PROCESS FOR DETECTING AND ADJUSTING A VERTICAL ORIENTATION OF MAGNETIC HEADS AND APPARATUS THEREFOR

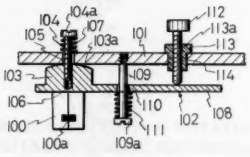
Goji Uchikoshi, and Niro Nakamichi, both of Tokyo, Japan, assignors to Nakamichi Research Inc., Tokyo, Japan

Filed Aug. 30, 1973, Ser. No. 393,049

Claims priority, application Japan, Oct. 3, 1972, 47-99292; Dec. 22, 1972, 47-129061; Dec. 13, 1972, 47-118336[U]

Int. Cl.[2] G11B 5/56, 5/43, 5/48

U.S. Cl. 360—76 8 Claims



3. An apparatus for detecting a vertical orientation of a magnetic reproducing head, said head having a slit gap divided into a plurality of channel portions, comprising a reference tape with a plurality of A.C. signals having the same phase recorded on its respective tracks by engagement of said tape with a reference magnetic recording head with a slit gap disposed substantially in a direction perpendicular to the running of said tape, deforming amplifying means to receive said reproduced signals from said respective tracks of said magnetic reproducing head to produce a first and a second rectangular wave signals, a flip-flop to receive said first and second rectangular wave signals and compare the phases between them based on the inclination of said magnetic reproducing head whereby when said first rectangular wave signal is advanced in phase relative to said second rectangular wave signal, a first output signal of "high" level and a second output signal of "low" level are produced therefrom and when said first rectangular wave signal is retarded in phase relative to said second rectangular wave signal, a first output signal of "low" level and a second output signal of "high" level are produced therefrom, and an indicator to indicate the direction of inclination of said magnetic reproducing head, said indicator including semiconductor switching means which is conductive or interruptive in response to "high" or "low" level of said first and second output signals from said flip-flop and serving to adjust said magnetic reproducing head so that said slit gap of said magnetic reproducing head is oriented in a properly vertical direction.

3,900,889

OPERATING MODE SWITCH FOR DIFFERENT TYPE OF TAPES

Werner Broghammer, Tennenbronn, Germany, assignor to Dual Gebruder Steidinger, St. Georgen, Black Forest, Germany

Filed Feb. 11, 1974, Ser. No. 441,001

Claims priority, application Germany, Mar. 12, 1973, 2312178

Int. Cl. G11b 15/18

U.S. Cl. 360—69 3 Claims

1. A tape machine for the playback of different types of magnetic tapes in cassettes and the operation of which requires a switching of the tape machine corresponding to their nature, which switching is effected by means of an opening which is, or is not, present in a given wall of the cassette, comprising

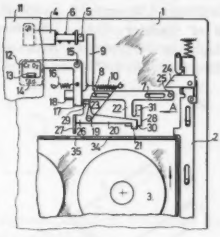
an operating-mode switch,

a setting member for actuating said operating-mode switch, spring means for moving said setting member in one direction of displacement,

an actuating device for actuating said setting member in opposition to said spring means, and actuated in each case with the movement involved in a placing of a tape cassette on said machine,

locking means for holding said setting member fast when it is displaced in opposition to said spring means,

a spring-loaded feeler member for sensing an opening in a cassette wall which determines the mode of operation and which is so coupled with said locking means that it eliminates the action of the latter upon penetration into said opening in said cassette wall, and



an operating member which can be brought manually into two positions associated with the modes of operation and which is coupled with said locking means and said setting member in such a manner that in one position it eliminates the action of said locking means, and upon being brought into the other position displaces said setting member in opposition to the spring means acting on it, said operating member being interlocked in an end position of displacement by said locking means when there is no opening in said cassette wall, and said operating member being returned by said setting member when the interlocking thereof is eliminated by removal of the cassette.

3,900,890

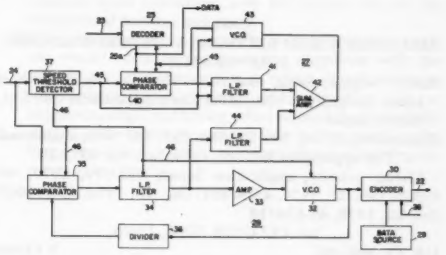
SPEED TOLERANT RECORDING AND RECOVERY SYSTEM

Jules A. Eibner, Maple Glen, Pa., assignor to Sperry Rand Corporation, Blue Bell, Pa.

Filed May 6, 1974, Ser. No. 467,323

Int. Cl.[2] G11B 15/52, 15/18, 27/36

U.S. Cl. 360—73 7 Claims



1. In a digital data tape handling system wherein there is included a tape transport mechanism for moving tape over a transducer element; an improved data transfer circuit for controlling the transfer of data to or from said transducer element which comprises: an oscillator means for generating a repetitive clocking signal for clocking the transfer of data through the transfer circuit, said oscillator means having a repetition frequency which varies in accordance with a refer-

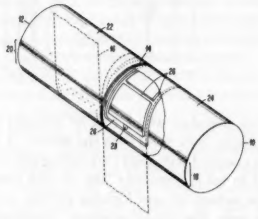
ence signal applied thereto, reference signal generating means coupled to said tape transport mechanism for generating a reference signal which varies in dependence upon the speed of the tape over the recording head, a threshold circuit coupled to said reference signal generator means for producing a control signal when the speed of the tape exceeds a predetermined fraction of its full speed, and means responsive to said control signal to render said oscillator means operative to clock the transfer of data through said data transfer circuit.

3,900,891

ROTATING-HEAD MANDREL WITH CAM SURFACE

Donald E. Griffiths; Clement H. Kalthoff, and Edward G. Laenen, all of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,143
Int. Cl.[2] G11B *5/48, 5/54, 5/60*
U.S. Cl. 360—84 **7 Claims**



1. On a cylindrical mandrel for supporting tape wrapped about the mandrel in the region of a rotor carrying a magnetic head, the improvement comprising:

a cam surface superimposed on the cylindrical surface of the mandrel, said cam surface being shaped so that, in planar cross-section perpendicular to the axis of the mandrel, the mandrel with cam surface resembles the cross-sectional shape of an eyeball sectioned from front to back;

said cam surface lifting the tape away from the rotating magnetic head as the head crosses the edge of tape;

said cam surface uniformly supporting the length of tape crossing the cam surface of the mandrel to the cylindrical portion of the surface of the mandrel so that tape flutter as the tape transitions from said cam surface to the cylindrical surface of the mandrel is minimized.

3,900,892

MAGNETIC VIDEO RECORDING AND REPRODUCING APPARATUS

Hiroshi Sugaya, Suita, and Hiroo Hosono, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 189,902, Oct. 18, 1971, abandoned. This application Jan. 29, 1974, Ser. No. 437,629
Claims priority, application Japan, Oct. 19, 1970, 45-92525; Oct. 27, 1970, 45-94851; Dec. 18, 1970, 45-116067; Dec. 29, 1970, 45-124710
Int. Cl.[2] G11B *15/66, 15/26*
U.S. Cl. 360—85 **5 Claims**

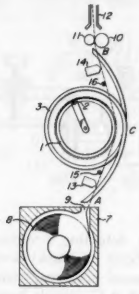
1. A magnetic video recording and reproducing apparatus comprising:

a cylindrical tape guide bearing a single rotary head;

a leader tape attached to the forward end of a magnetic tape, the rigidity and width of said leader tape being greater than the rigidity and width of the magnetic tape;

an elongated leader tape guide, having a longitudinal opening portion, wound over an angular range of 360° of the outer periphery of said cylindrical tape guide substantially in a helical form with said opening portion facing said tape guide;

tape transport means for introducing said leader tape into one end of said leader tape guide, the axis of said cylindrical tape guide being inclined with respect to the axis of the helix of said helical opening portion in such a manner that the angle between the axis of said inclined cylindrical tape guide and the longitudinal center line of a portion of said leader tape guide including said one end of said leader tape guide into which said magnetic tape is introduced in a forward winding operation is larger than the angle between the axis of the helix of said helical opening and said longitudinal center line thereby to ensure closed winding of the magnetic tape on said tape guide over an angular range of 360° for continuous recording on the so wound magnetic tape by said single magnetic head, said magnetic tape being transported on said tape guide along a passage in a form similar to said helical form of said tape guide; and



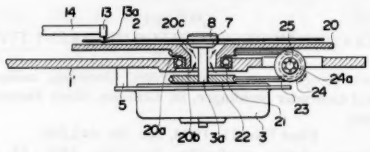
means for taking up said leader tape and magnetic tape from the other end of said leader tape guide.

3,900,893

AIR BEARING SUPPORTED FLEXIBLE DISC DEVICE WITH OPPOSITELY ROTATING STABILIZATION PLATE

Kunio Hirose, Jouyo, and Akira Mayeda, Nishinomiya, both of Japan, assignors to Sanyo Electric Company, Ltd., Osaka, Japan

Filed Feb. 12, 1974, Ser. No. 441,886
Claims priority, application Japan, Feb. 16, 1973, 48-19591
Int. Cl. G11b *5/60, 17/02*
U.S. Cl. 360—99 **4 Claims**



1. A recording and/or reproducing device for use with a flexible foil type record which is rotated at high speed, which comprises in combination:

a mounting spindle for engaging the record substantially at its center to cause the record to rotate therewith;

a stationary plate arranged to underlie the record;

a rotatable stabilization plate situated between said record and said stationary plate;

means defining at least one passage for the introduction of air between said record and said rotatable stabilization plate;

transducer means for coacting with the record;

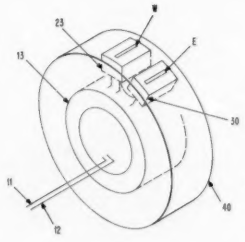
means supporting said transducer means for movement in a radial direction relative to said record;

separate means for rotating said mounting spindle together with said record and said rotatable stabilization plate in opposite directions with respect to each other thereby inducing a flow of air from the passage, between the record and said rotatable stabilization plate, and away from the center of the record to form a rotation induced air cushion to permit the record to hover parallel above the rotatable stabilization plate in spaced relation to the latter.

3,900,894
WRITE-ERASE CIRCUITS FOR ROTATING HEAD DIGITAL MAGNETIC RECORDERS

Rahmat A. Aziz, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1974, Ser. No. 519,740
Int. Cl.[2] G11B *5/09, 5/47, 5/52, 15/12*
U.S. Cl. 360—108 **8 Claims**



1. For use in a rotating head signal recorder:

an improved write-erase apparatus including in combination:

a rotating transformer having a stationary center-tapped primary winding, and a rotatable center-tapped secondary winding magnetic coupled to said center-tapped primary winding,

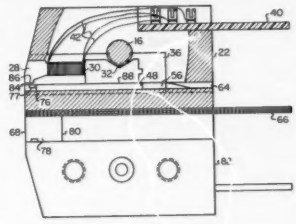
a center-tapped recording coil for a recording head having its opposite ends respectively connected to ends of said secondary winding and mounted for rotation therewith, and

an erase coil element electrically interconnected between the center taps of said secondary winding and said recording coil.

3,900,895
MAGNETIC READ-RECORD HEAD WITH HOUSING LOCATOR STRUCTURE

William I. Girdner, and John H. Miller, III, both of San Jose, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 12, 1973, Ser. No. 405,943
Int. Cl.[2] G11B *5/27, 5/25, 5/105, 5/42*
U.S. Cl. 360—121 **4 Claims**



1. An electromagnetic read-record head having a read-record surface and comprising:

a plurality of electromagnetic transducers, each comprising a transducer core having a transducing end with a first pole face and a first read-record surface portion, having a middle segment with a coil would thereabout, and having another end with a positioning notch therein;

a transducer frame having a support section to support the transducing end of each transducer, the support section having a second read-record surface portion, and the transducer frame also having a cylindrical support bar with annular slots and spaced apart from and parallel to the support section for supporting and positioning each transducer core other end by engaging each transducer positioning notch, thereby providing mutual alignment of the transducer first pole faces;

shielding means comprising a magnetic shield between each two transducers for magnetically shielding each transducer from others of the transducers each shield having a notch for engaging one of the annular slots in the support bar;

return means for providing a separate magnetic flux path for flux in each transducer core comprising a plurality of return cores, each having a second pole face at one end, and positioned in substantial alignment with the transducers, with each first pole face facing one second pole face and spaced apart therefrom forming a transducing gap between each transducer core and return core at the read-record surface; and

holding and positioning means for holding and positioning the return cores in corresponding alignment with the transducer cores comprising a return frame having a substantially flat read-record surface portion with a lengthwise edge, and having a face formed at substantially a right angle to the flat read-record surface portion, the face extending along the lengthwise edge and holding the return cores therein.

DESIGN PATENTS

GRANTED AUGUST 19, 1975

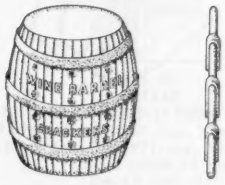
ERRATA

For CLASS	See PATENT NO.
048–003	236,367

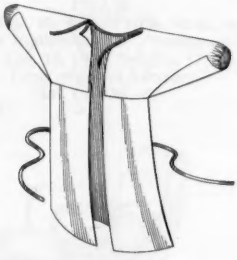
DESIGNS

GRANTED AUGUST 19, 1975

236,292
CRACKER
Albert C. Friedrich, San Jose, Calif., assignor to Wine Barrel Corporation, Campbell, Calif.
Filed Nov. 8, 1973, Ser. No. 414,074
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—15



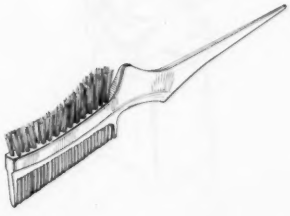
236,293
SURGICAL GOWN
Percival C. Banks, Deerfield, Ill., assignor to American Hospital Supply Corporation
Filed Feb. 28, 1973, Ser. No. 336,516
Term of patent 14 years
Int. Cl. D2—*17*
U.S. Cl. D2—17



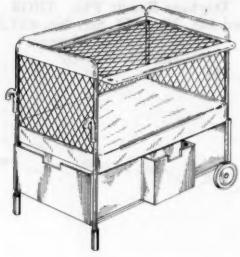
236,294
NECKTIE
Robert R. Newell, 2828 N. Atlantic Ave., Daytona Beach, Fla. 32018
Filed Jan. 29, 1974, Ser. No. 437,544
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—351

236,295
BRUSH TYPE SWEEPER FOR LITTER AND THE LIKE
Noel W. Fleury, London, England, assignor to Bissell, Inc., Grand Rapids, Mich.
Filed Aug. 5, 1974, Ser. No. 494,768
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—12

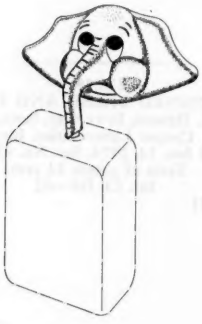
236,296
COMBINED BRUSH AND COMB
Richard M. Hyman, Iowa City, Iowa, assignor to Cooper Laboratories, Inc.
Filed Jan. 14, 1974, Ser. No. 433,065
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—21



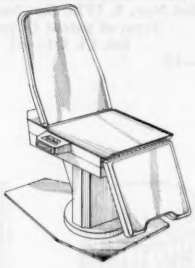
236,297
COMBINED CRIB AND DRESSING TABLE
Herbert K. Saxe, 302 W. 79th St., New York, N.Y. 10024
Filed June 25, 1973, Ser. No. 373,478
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—6



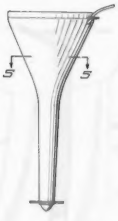
236,298
SOAP HOLDER
Robert D. Baca, 259 Elm St., San Bruno, Calif. 94066
Filed June 24, 1974, Ser. No. 482,325
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—90



236,299
MEDICAL EXAMINATION CHAIR
Larry K. Long, Tempe, Thomas C. Knight, Scottsdale, and William F. Jackson and John W. Winter, Phoenix, Ariz., assignors to Advanced Management Engineering & Research Co., Phoenix, Ariz.
Filed Feb. 22, 1973, Ser. No. 334,831
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—22



236,300
PORTABLE SEAT
George J. Hartinger, 3906 Thomas Ave. N., Minneapolis, Minn. 55412
Continuation-in-part of design application Ser. No. 184,647, Sept. 28, 1971. This application July 20, 1973, Ser. No. 381,156
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—26



236,301
TABLE
Manus Mudde, Berkel-Enschot, Netherlands, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 22, 1973, Ser. No. 325,913
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27

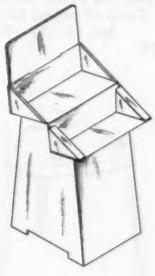
236,302
CHAIR
Alfred J. Prizlow, Bloomfield Hills, Mich., assignor to GF Business Equipment, Inc., Youngstown, Ohio
Filed Aug. 25, 1971, Ser. No. 175,034
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

236,303
CHAIR
Alfred J. Prizlow, Bloomfield Hills, Mich., assignor to GF Business Equipment, Inc., Youngstown, Ohio
Filed Aug. 25, 1971, Ser. No. 175,035
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

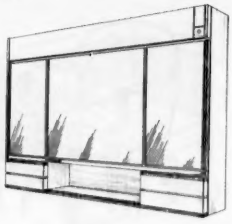
236,304
CHAIR
Morris F. Fisher, Carmel, Ind., assignor to Jackson Chair Co., Inc., Danville, Ky.
Filed Mar. 25, 1974, Ser. No. 454,120
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

236,305
CHAIR
Morris F. Fisher, Carmel, Ind., assignor to Jackson Chair Co., Inc., Danville, Ky.
Filed Mar. 25, 1974, Ser. No. 454,121
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

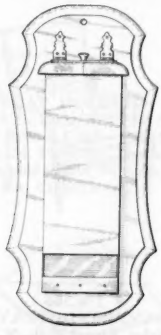
236,306
MERCHANDISE DISPLAY STAND
Arthur E. Spieler, Floral Park, N.Y., assignor to Jonathan Leigh Inc., New York, N.Y.
Filed Apr. 17, 1974, Ser. No. 461,776
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85



236,307
WALL MOUNTED VANITY CABINET
Jean-Paul Dranssart, Voiron, Isere, France, assignor to Allibert Exploitation, Puteaux, Hauts-de-Seine, France
Filed July 23, 1973, Ser. No. 381,596
Claims priority, application France Jan. 23, 1973
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—104



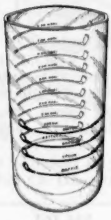
236,308
CIGARETTE PACK DISPENSER
Maurene J. Ball, 6531 Monaco St., Commerce City, Colo. 80022
Filed Sept. 11, 1974, Ser. No. 504,879
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—114



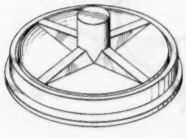
236,309
KNOCKDOWN TABLE
Robert T. Howitt, Leominster, Mass.
Filed Oct. 10, 1973, Ser. No. 405,018
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—176

236,310
DRINKING GLASS OR SIMILAR ARTICLE
Michio Yamato and Hiroshi Yokoo, Tokyo, Japan, assignors to Suntory Limited, Los Angeles, Calif.
Filed Dec. 12, 1973, Ser. No. 424,154
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—6

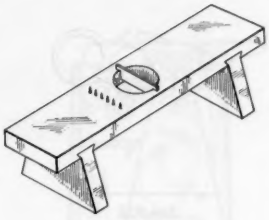
236,311
DRINKING GLASS OR SIMILAR ARTICLE
Michio Yamato and Hiroshi Yokoo, Tokyo, Japan, assignors to Suntory Limited, Los Angeles, Calif.
Filed Dec. 12, 1973, Ser. No. 424,155
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—6



236,312
PATTY MAKER
De Peyster D. Brown, 4281 Admirable Drive, Portuguese Bend, Calif. 90274
Filed Aug. 27, 1973, Ser. No. 391,858
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—43



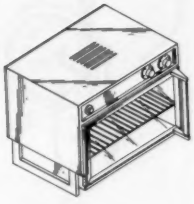
236,313
CORN GRATER
Emeline H. Malpas, The Secret Farmhouse, Little River, Calif. 95456
Filed Jan. 11, 1974, Ser. No. 432,737
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47



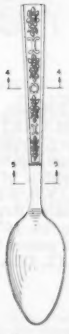
236,314
MEASURING PITCHER
Gerald Y. Sugai, 3379 Weatherford Court, Simi Valley, Calif. 93063
Filed Apr. 18, 1974, Ser. No. 461,985
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—64

236,315
COMBINED VACUUM BOTTLES, SANDWICH BOX AND CARRYING CASE THEREFOR
Ronald D. Russo, Colchester, Conn., assignor to King-Seeley Thermos Co.
Filed Apr. 8, 1974, Ser. No. 458,537
Term of patent 14 years
Int. Cl. D3—*01*; D7—*99*
U.S. Cl. D7—76

236,316
OVEN
Donald J. Booty, Frankfort, Ill., and Irving R. Belinkoff, Queens Village, and David W. Balter, Bronx, N.Y., assignors to LCA Corporation, Yonkers, N.Y.
Filed Aug. 24, 1973, Ser. No. 378,857
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—126

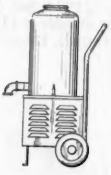


236,317
SPOON OR SIMILAR ARTICLE
Colin B. Richmond II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Mar. 1, 1974, Ser. No. 447,096
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

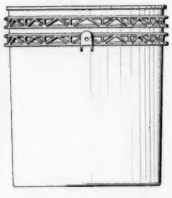


236,318
SPOON OR SIMILAR ARTICLE
Colin B. Richmond II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Apr. 29, 1974, Ser. No. 464,892
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

236,319
VACUUM CLEANER HOUSING
Richard Lawrence Jakubuwski, P.O. Box 1412, Fort Myers, Fla. 33902
Filed Jan. 28, 1974, Ser. No. 437,539
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—166

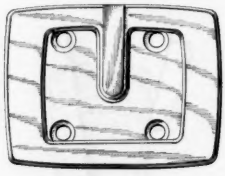


236,320
BUCKET
Cecil Renou, Johannesburg, Transvaal, Republic of South Africa, assignor to Renou Plastics (Proprietary) Limited, Isando, Transvaal, Republic of South Africa
Filed Mar. 22, 1974, Ser. No. 454,016
Claims priority, application Republic of South Africa Jan. 29, 1974
Term of patent 7 years
Int. Cl. D7—*07*
U.S. Cl. D7—187



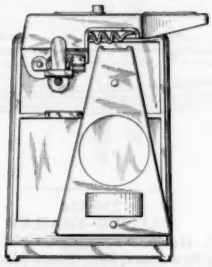
236,321
SKINNING KNIFE
Walter V. Cromoga, 3540 Portland Ave. Tacoma, Wash. 98404
Filed Feb. 25, 1974, Ser. No. 445,387
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—20

236,322
BUCKLE
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Elmwood Park, N.J.
Filed Jan. 30, 1974, Ser. No. 437,931
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—122



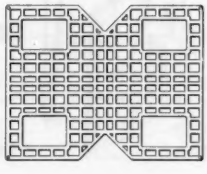
236,323
DECORATIVE HIDDEN HOOK
Carolyn L. Johnsen and Walter J. Johnsen, both of 921 Kirby Drive, La Habra, Calif. 90631
Filed Dec. 26, 1973, Ser. No. 428,357
Term of patent 3½ years
Int. Cl. D8—*08*
U.S. Cl. D8—257

236,324
COMBINED CAN OPENER AND KNIFE SHARPENER
Carl E. Richard, Enfield, and Gerald E. Rideout, South Windsor, Conn., assignors to General Signal Corporation
Filed Aug. 27, 1973, Ser. No. 392,150
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—35



236,325
PACKAGE FOR CATHETERS
David Carleton Miller, Camillus, N.Y., assignor to Ethicon, Inc., Somerville, N.J.
Filed Aug. 8, 1973, Ser. No. 386,814
Term of patent 14 years
Int. Cl. D9—*106;* D24—*04*
U.S. Cl. D9—187

236,326
STACKING AID FOR CONTAINERS
Lionel F. Trebilcock, Girard, Ohio, assignor to Litco Plastics, Vienna, Ohio
Filed Apr. 6, 1973, Ser. No. 348,748
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—294

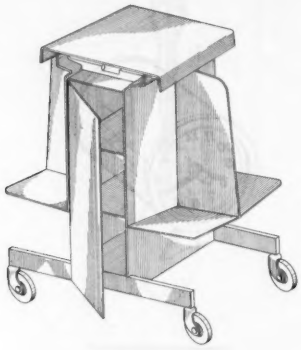


236,327
CLOCK OR SIMILAR ARTICLE
Morris W. Wilson, Fairfield, Conn., assignor to General Electric Company
Filed Nov. 9, 1973, Ser. No. 414,368
Term of patent 7 years
Int. Cl. D10—*01*
U.S. Cl. D10—23

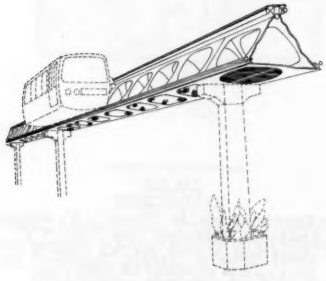
236,328
REFLECTOR
Walter Dorwin Teague, Jr., Nyack, N.Y., assignor to Amerace Corporation, New York, N.Y.
Filed Sept. 3, 1974, Ser. No. 502,894
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

236,329
REFLECTOR
Walter Dorwin Teague, Jr., Nyack, N.Y., assignor to Amerace Corporation, New York, N.Y.
Filed Sept. 3, 1974, Ser. No. 502,979
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

236,330
REPRODUCTION MACHINE STACKING CART
Jacob W. Patla, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 27, 1973, Ser. No. 428,935
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—28

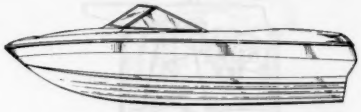


236,331
BEAM FOR ELEVATED RAILWAY
Lawrence K. Edwards, 565 Arastradero Road, Palo Alto, Calif. 94306
Filed Oct. 2, 1973, Ser. No. 402,841
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D12—49



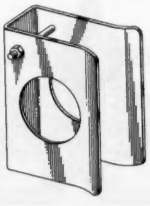
236,332
BOAT
David T. Livingston, Seattle, Wash., assignor to Reinell Boats, Inc., Marysville, Wash.
Filed Aug. 27, 1973, Ser. No. 391,748
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62

236,333
BOAT
David T. Livingston, Seattle, Wash., assignor to Reinell Boats, Inc., Marysville, Wash.
Filed Aug. 30, 1973, Ser. No. 393,058
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



236,334
CAMPER TRAILER
Joseph G. Heath, Northridge, Calif., assignor to Hunter Structures, Inc., Santa Monica, Calif.
Filed Nov. 24, 1972, Ser. No. 309,606
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—103

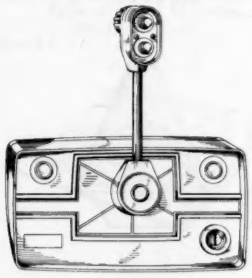
236,335
BICYCLE HOLDER
Michael J. Lacivita, 3220 Eldora Drive, Youngstown, Ohio 44511
Filed Jan. 24, 1974, Ser. No. 436,386
Term of patent 7 years
The portion of the term of the patent subsequent to Aug. 2, 1980, has been disclaimed
Int. Cl. D8—*99*
U.S. Cl. D12—115



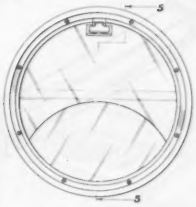
236,336
BICYCLE FORK
Thomas D. Seifert, Aracadia, Calif., assignor to LRV Industries, South El Monte, Calif.
Filed Nov. 4, 1974, Ser. No. 520,632
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—118

236,337
VEHICLE WINDSHIELD WIPER BLADE ASSEMBLY
Raymond A. Deibel, West Falls, N.Y., assignor to Trico Products Corporation, Buffalo, N.Y.
Filed Aug. 8, 1973, Ser. No. 386,522
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

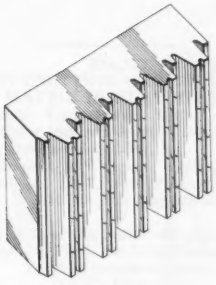
236,338
SINGLE HANDLE MARINE ENGINE CONTROL HOUSING
Arthur F. Miller, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.
Filed May 1, 1974, Ser. No. 465,909
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—179



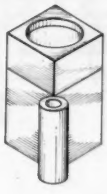
236,339
CIRCULAR TRAILER WINDOW
Lynn S. Polk, San Bernardino, Calif., assignor to Le Van Specialty Company, Inc.
Filed June 18, 1973, Ser. No. 371,248
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—183



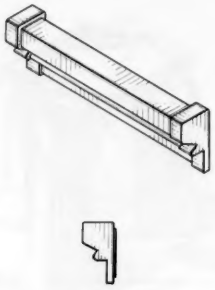
236,340
EXTERIOR MOLDED PANEL FOR DATA PROCESSING UNITS
Richard G. Clayton, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Filed Aug. 9, 1973, Ser. No. 387,109
Term of patent 14 years
Int. Cl. D14—*99*; D25—*01*
U.S. Cl. D13—1 J



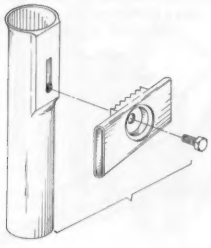
236,341
COMBINED CLIP DISPENSER AND PENCIL HOLDER
Robert M. Leedy, 7 Martindale Road, Short Hills, N.J. 07078
Filed Nov. 19, 1973, Ser. No. 417,278
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75



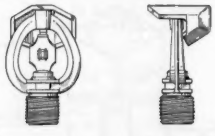
236,342
SHEET MATERIAL HOLDER
Geronimo A. Dango, 805 Coronado Terrace, Los Angeles, Calif. 90026
Filed Sept. 19, 1973, Ser. No. 398,580
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91



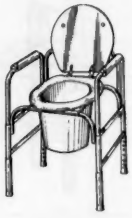
236,343
FISH ROD HOLDER
Leon A. Polzin, P.O. Box 54, Cuero, Tex. 77954
Filed Sept. 4, 1973, Ser. No. 394,104
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—22



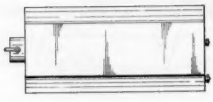
236,344
SPRINKLER
Theodore Vorkapich, Brunswick, Ohio, assignor to American LaFrance, Inc., Willoughby, Ohio
Filed Jan. 18, 1974, Ser. No. 434,683
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—6



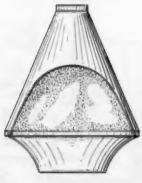
236,345
BEDSIDE COMMODE
Morton I. Thomas, Bakertown Road, Monroe, N.Y. 10950
Filed June 4, 1973, Ser. No. 366,500
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48



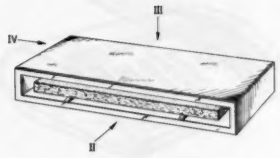
236,346
WOOD BURNING HEATER
Samuel B. Kemple, Independence, Mo., assignor to Four Seasons Woodburning Heater Co., Inc.
Filed Mar. 13, 1974, Ser. No. 450,820
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—93



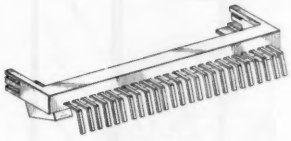
236,347
FREE STANDING FIREPLACE
Glen D. Crownover, Santa Rosa, Calif., assignor to Malm Fireplaces, Inc., Santa Rosa, Calif.
Filed Aug. 30, 1972, Ser. No. 284,745
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



236,348
AIR FRESHENER
Georg Schimanski, Rummenohl, Germany, assignor to Globol-Werk GmbH, Neuburg an der Donau, Germany
Filed Sept. 11, 1973, Ser. No. 396,285
Claims priority, application Germany June 5, 1973
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—150

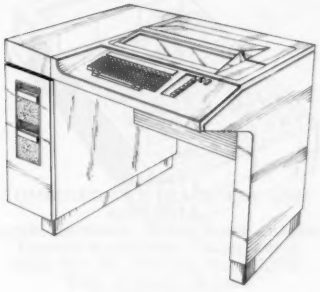


236,349
MULTI-CONTACT DIELECTRIC HOUSING FOR RECEIVING AN OPTICAL DISPLAY READOUT DEVICE
Abul Abbas Mesbahuddin Ahmed, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 23, 1973, Ser. No. 335,218
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 B

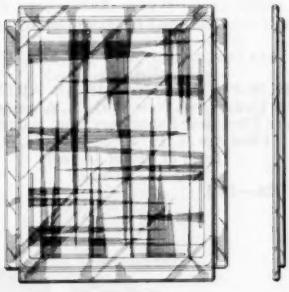


236,350
CALCULATOR
Elmer J. Stoltz, Castro Valley, and Richard A. Nyquist, Menlo Park Calif., assignors to The Singer Company, New York, N.Y.
Filed Dec. 26, 1973, Ser. No. 427,877
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

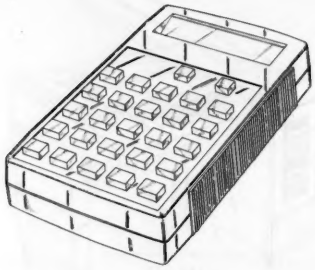
236,351
TAPE UNIT AND CONSOLE FOR A DATA SYSTEM
Richard G. Clayton, Detroit, and Jerry J. Sims, Southfield, Mich., assignors to Burroughs Corporation, Detroit, Mich.
Filed Dec. 17, 1973, Ser. No. 424,935
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



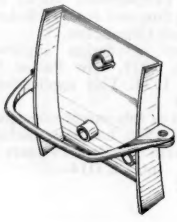
236,352
LIGHT EMITTING GAS DISCHARGE MATRIX DISPLAY PANEL
Fred E. Mansur, Temperance, Mich., and Charles W. Salisbury, Rising Sun, and John C. Baker, Toledo, Ohio, assignors to Owens-Illinois, Inc.
Continuation-in-part of design application Ser. No. 159,083, July 1, 1971, now Patent No. D. 230,983, dated Mar. 26, 1974. This application Jan. 4, 1974, Ser. No. 431,001
The term of this patent subsequent to Mar. 26, 1988, has been disclaimed
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



236,353
CALCULATOR
Manfred Link, Nuremberg, Germany, assignor to Triumph Werke Nurnberg A.G.
Filed Apr. 26, 1974, Ser. No. 464,318
Claims priority, application Germany Nov. 12, 1973
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

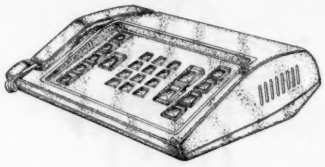


236,354
LOCKING DEVICE FOR TELEPHONE DIALS
Carmelo Rodriguez, 35—41 Fort Washington Ave. (Apt. 1A), New York, N.Y. 10032
Filed Mar. 29, 1974, Ser. No. 456,023
Term of patent 14 years
Int. Cl. D8—*07;* D14—*03*
U.S. Cl. D26—14 A

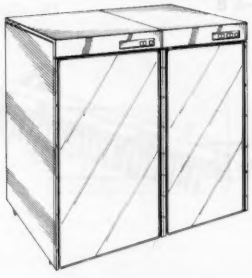


236,355
MICROPHONE OR SIMILAR ARTICLE
Peter Quay Yang, New York, N.Y., assignor to Lanier Electronic Laboratory, Inc., Atlanta, Ga.
Filed Apr. 1, 1974, Ser. No. 456,595
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 J

236,356
TELEPHONE INSTRUMENT
John Forrest Henshaw, Mill Valley, Victor Herbert Henshaw, Alamo, and Charles Phillips, San Francisco, Calif., assignors to Litton Business Telephone Systems, Inc., Sunnyvale, Calif.
Filed Dec. 18, 1974, Ser. No. 534,076
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A



236,357
CABINET FOR A DATA SYSTEM
Richard G. Clayton, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Filed Sept. 20, 1973, Ser. No. 399,124
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



236,358
CIGARETTE LIGHTER
William R. Forelli, 19 Compo Road, Westport, Conn. 06880
Filed May 24, 1974, Ser. No. 472,976
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—39

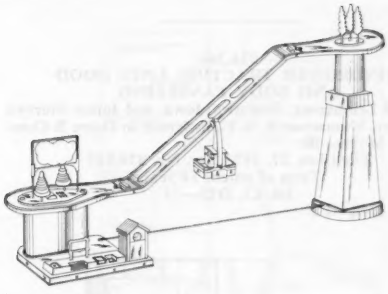
236,359
CIGAR TIP
Theodore Eron, Demarest, N.J., assignor to American Brands, Inc., New York, N.Y.
Filed July 30, 1973, Ser. No. 384,119
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—7

236,360
MEDALLION
Charles E. Youngblood, 1360 Bradbury Road, San Marino, Calif. 91108
Filed Aug. 17, 1973, Ser. No. 389,355
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—19 R

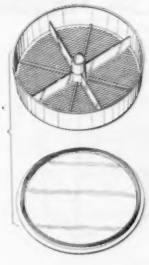
236,361
CHESS-MAN OR SIMILAR ARTICLE
Gabriel Vincente Maura, Apartaclo CK, Rio Piedras, Puerto Rico
Filed Feb. 1, 1974, Ser. No. 438,583
Claims priority, application Spain Aug. 3, 1973
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CH

236,362
RIDER TRAINER
Sam Reeves, 3711 Kris, Fort Worth, Tex. 76118
Filed Aug. 6, 1973, Ser. No. 386,056
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 L

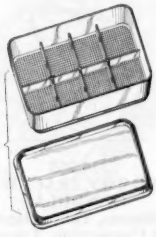
236,363
COMBINED TOY TRACKWAY AND GONDOLA
Kazuyuki Hashimoto, Tokyo, Japan, assignor to Toytown Corporation, Tokyo, Japan
Filed Nov. 20, 1973, Ser. No. 417,505
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 A



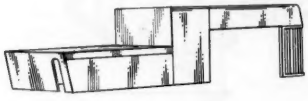
236,364
CIRCULAR SPROUTER WITH A BOTTOM COVER
Harold Lavar Fox, 2823 Loran Heights Drive, Salt Lake City, Utah 84109
Filed July 11, 1974, Ser. No. 487,454
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A

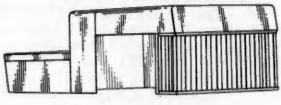


236,365
RECTANGULAR OR SQUARE SPROUTER WITH A BOTTOM COVER
Harold Lavar Fox, 2823 Loran Heights Drive, Salt Lake City, Utah 84109
Filed July 11, 1974, Ser. No. 487,455
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3 A



236,366
WINDROWER TRACTION UNIT HOOD AND BODY PANELLING
Joe Paul Leinhauser, Ottumwa, Iowa, and James Mervyn Conner, Mamaroneck, N.Y., assignors to Deere & Company, Moline, Ill.
Filed Jun. 27, 1973, Ser. No. 374,027
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 E



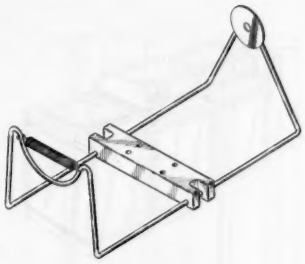


236,367
CEILING LAMP
Harden Estell, 827 E. 18th St., Oakland, Calif. 94606
Filed Nov. 23, 1973, Ser. No. 418,198
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—3

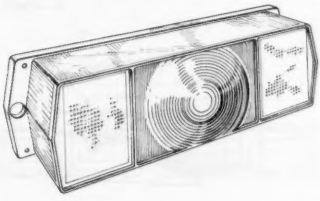
236,368
PICTURE HOLDING PENDANT
Kent L. Jacobson, Moraga, Calif., assignor to Tyrrell Jewelers, Inc., Walnut Creek, Calif.
Filed Dec. 21, 1973, Ser. No. 427,078
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—15

236,369
CANDLEHOLDER
Preston J. Frazier, Jr., Houston, Tex., assignor to Faroy, Inc.
Filed Aug. 30, 1973, Ser. No. 393,149
Term of patent 14 years
Int. Cl. D7—*01*; D26—*01*
U.S. Cl. D48—2

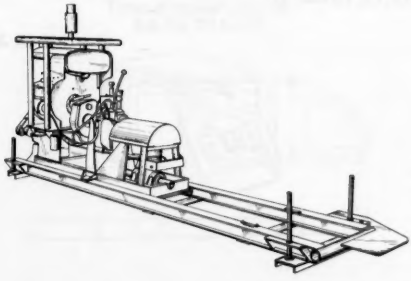
236,370
TROUBLE LIGHT SUPPORT
Harry L. Martin, 2324 N. Ricketts, Sherman, Tex. 75090
Filed Sept. 10, 1973, Ser. No. 395,534
Term of patent 14 years
Int. Cl. D26—*99*
U.S. Cl. D48—4 A



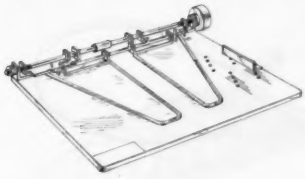
236,371
TAIL LIGHT
Peter E. Brudy, Willowdale, Ontario, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Ontario, Canada
Filed Aug. 9, 1973, Ser. No. 387,203
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 R



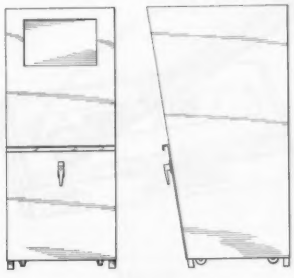
236,372
PORTABLE EARTH BORING MACHINE
Richard P. Dunn, Wichita Falls, Tex., assignor to International Boring Systems Co., Inc., Wichita Falls, Tex.
Filed Aug. 7, 1972, Ser. No. 278,349
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D54—14 R



236,373
MACHINE FOR CASING BOOKS
Charles T. Groswith III, Los Altos, and Danilo P. Buan, Pleasanton, Calif., assignors to Velo-Bind, Inc., Sunnyvale, Calif.
Filed Apr. 18, 1973, Ser. No. 352,345
Term of patent 14 years
Int. Cl. D18—*04*
U.S. Cl. D55—1 R

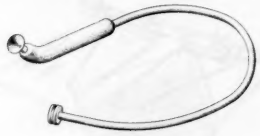


236,374
TRASH COMPACTOR
Dario J. Moriconi, Bloomfield Hills, Mich., assignor to McClain Industries Inc., Utica, Mich.
Filed Jan. 14, 1974, Ser. No. 433,133
Term of patent 14 years
Int. Cl. D7—*07;* D15—*99*
U.S. Cl. D55—1 B

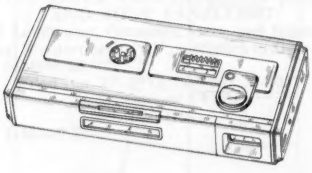


236,375
TRASH COMPACTOR
Dario J. Moriconi, Bloomfield Hills, Mich., and Earl S. Edwards, Windsor, Ontario, Canada, and Kenneth D. McClain, Utica, Mich., assignors to McClain Industries Inc., Utica, Mich.
Filed Feb. 14, 1974, Ser. No. 442,314
Term of patent 14 years
Int. Cl. D7—*07;* D15—*99*
U.S. Cl. D55—1 B

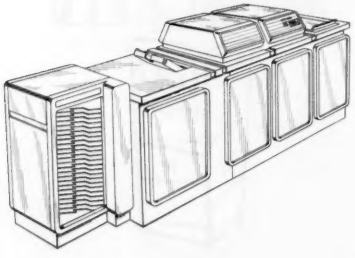
236,376
CONTACT LENS INSERTING AND REMOVING DEVICE
Edward R. Updegraff, 6094 Montgomery Court, San Jose, Calif 95135
Filed Dec. 3, 1973, Ser. No. 421,188
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 R



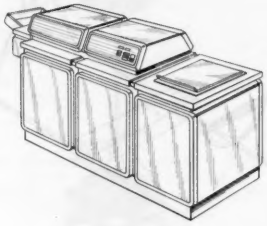
236,377
CAMERA OR SIMILAR ARTICLE
Yoshiro Takata, Nagaokakyo, and Eiko Otsuki, Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Nov. 5, 1973, Ser. No. 413,107
Claims priority, application Japan Dec. 29, 1972
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1 B



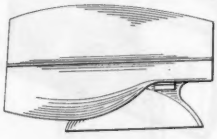
236,378
DOCUMENT DUPLICATING AND SORTING MACHINE
Daniel N. Yanofsky, Jericho, N.Y., assignor to Pitney-Bowes, Inc., Stamford, Conn.
Filed Dec. 3, 1973, Ser. No. 421,150
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



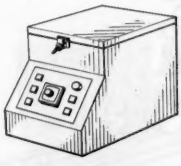
236,379
DUPLICATING MACHINE
Daniel N. Yanofsky, Jericho, N.Y., assignor to Pitney-Bowes, Inc., Stamford, Conn.
Filed Dec. 3, 1973, Ser. No. 421,151
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



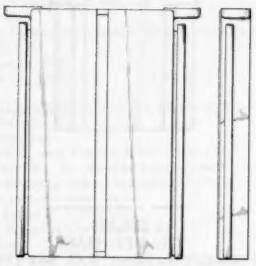
236,380
PROJECTION CABINET
Charles Topfer, Mentor, Ohio, assignor to Rappaport Exhibits, Inc.
Filed Mar. 11, 1974, Ser. No. 449,971
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1 N



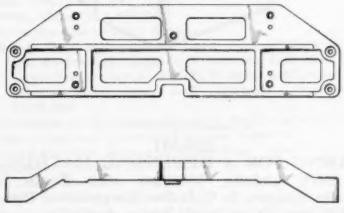
236,381
X-RAY FILM DUPLICATOR/SUBTRACTOR UNIT
Richard L. Evenson, and William J. Overton, Portland, Oreg., assignors to Northwest Refining Company, Portland, Oreg.
Filed Mar. 29, 1974, Ser. No. 455,989
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D61—1 Q



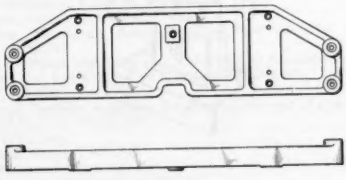
236,382
DRIVE HOUSING AND GUIDES FOR GAUGE SUPPORT CARRIAGE FOR PRESS BRAKE OR THE LIKE
Gerald V. Roch, Indianapolis, Ind., assignor to Hurco Manufacturing Company, Inc.
Filed July 30, 1973, Ser. No. 383,589
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D63—1



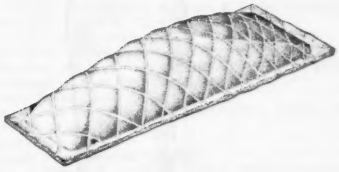
236,383
GAUGE SUPPORT CARRIAGE WITH OFFSET ENDS FOR PRESS BRAKE OR THE LIKE
Gerald V. Roch, Indianapolis, Ind., assignor to Hurco Manufacturing Company, Inc.
Filed July 30, 1973, Ser. No. 383,590
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D63—1

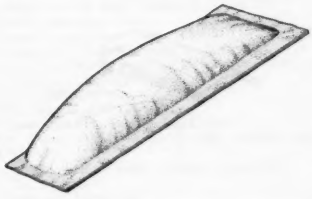


236,384
GAUGE SUPPORT CARRIAGE FOR PRESS BRAKE OR THE LIKE
Gerald V. Roch, Indianapolis, Ind., assignor to Hurco Manufacturing Company, Inc.
Filed July 30, 1973, Ser. No. 383,591
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D63—1

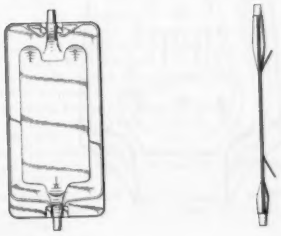


236,385
DISPOSABLE SANITARY PAD
Robert Celander, Pixbo, Jan-Åke Noll, Molndal, and Urban Widlund, and Kerstin Strandberg, Pixbo, Sweden, assignors to AB Stios, Goteborg, Sweden
Filed Nov. 21, 1973, Ser. No. 417,802
Claims priority application Sweden May 21, 1973
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1 A

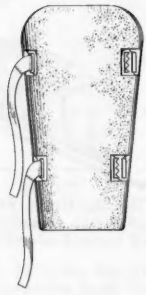




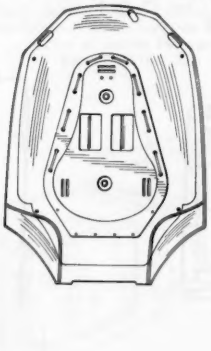
236,386
OSTOMY DRAINAGE BAG
Marvin Katzman, 1520 202nd St., Bayside, N.Y. 11360, and Neil De Fluri, 952 Arnet Ave., Union, N.J. 07083
Filed Jan. 21, 1974, Ser. No. 435,121
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D83—1 P



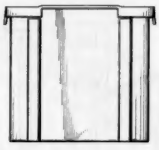
236,387
HOLDER FOR OSTOMY DRAINAGE BAG
Marvin Katzman, 1520 202nd St., Bayside, N.Y. 11360, and Neil De Fluri, 952 Arnet Ave., Union, N.J. 07083
Filed Jan. 28, 1974, Ser. No. 437,134
Term of patent 14 years
Int. Cl. D2—*02*; D24—*03*
U.S. Cl. D83—1 P



236,388
DIVER BACK PACK
William D. Walters, 2940 Andros Ave., Costa Mesa, Calif. 92626
Filed June 5, 1972, Ser. No. 260,062
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



236,389
QUILL BOX
Olin H. Baker, Madison, Ind., assignor to Meese, Inc.
Filed Jan. 14, 1974, Ser. No. 432,960
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D87—1 R



236,390
TRAVEL CASE
Frederick K. Bauer, P.O. Box 1705, Beverly Hills, Calif. 90213
Filed Apr. 30, 1973, Ser. No. 355,581
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 F

236,391
CASING FOR A DISPENSING MACHINE
Robert Berk Audette, Mosman, New South Wales, Australia, assignor to Cafe-Bar International Pty., Ltd., North Sydney, New South Wales, Australia
Filed Dec. 27, 1973, Ser. No. 428,775
Term of patent 14 years
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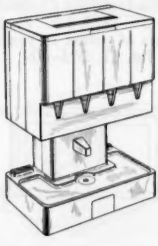

LIST OF PATENTEES

TO WHOM

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Bell, C. Gordon; Buzynski, John E.; Kaman, Charles H.; and O'Loughlin, James F., to Digital Equipment Corporation. Branching circuit for microprogram controlled central processor unit. 3,900,835, Cl. 340-172.500.

Bell, Gregory R. Electronic power metering device. 3,900,794, Cl. 324-142.000.

Bell & Howell Company: *See*—
Rolker, John H.; and Carson, Bradley A., 3,900,320.
Westover, Dwight G.; and Grant, Frederic F., 3,900,191.

Bell-Northern Research, Ltd.: *See*—
Bard, Allen J.; and Takvoryan, Nurhan E., 3,900,418.

Bell, Reuben H.; and Foley, Kevin M., to Owens-Corning Fiberglas Corporation. Flame retardants for plastic foams. 3,900,506, Cl. 260-448.80A.

Bell, Rupert B., to R. L. Kuss & Co., Inc. Fuel tank filter. 3,900,397, Cl. 210-128.000.

Bell Telephone Laboratories, Incorporated: *See*—
Ault, Cyrus Frank, 3,900,820.
Collier, Robert Jacob; and Herriott, Donald Richard, 3,900,737.
Dapkus, Paul Daniel; Dixon, Richard Wayne; and Weick, Walter Werner, 3,900,864.
Larkin, Robert S.; Lund, Nean K.; and Williams, Charlton E., 3,900,874.
Silfvast, William Thomas; and Wood II, Obert Reeves, 3,900,803.

Bellasio, Elvio; and Cristiani, Franco, to Gruppo Lepetit, S.p.A. 2-Aryl-3-isopropylamino-1-butanols. 3,900,515, Cl. 260-501.170.

Bellis, Carlo: *See*—
Ravera, Giovanni; Siletto, Giorgio; and Bellis, Carlo, 3,900,256.

Beloit Corporation: *See*—
Nelson, John P.; Page, Robert E.; and Hendrickson, Paul S., 3,900,364.

Belstad, Arne: *See*—
Sjoberg, Borje Gustav; Odman, Rolf Ragnar; Belstad, Arne; and Lofgren, Nils Clov Allan, 3,900,293.

Bendel, Hermann, to Siemens Aktiengesellschaft. Selective echo suppressor. 3,900,708, Cl. 179-170.200.

Bendix Corporation, The: *See*—
Scardilli, Vincent; and Sessman, Arthur, 3,900,647.
Spencer, Andrew R., 3,900,629.

Benedict, Charles E.; and Oliver, Calvin C., to Wayne H. Coloney Company, Inc.; and Controlled Acoustics, Inc. Lug strap for weaving loom. 3,900,052, Cl. 139-153.000.

Benitz, Earl. Expandable bit screw holding screwdriver. 3,900,057, Cl. 145-50.00E.

Bennett, Frank Prescott; and Feitzinger, Eduard, to GAF Corporation. Developing apparatus for photocopy machines. 3,900,862, Cl. 354-300.000.

Bennett, James G.: *See*—
Cooper, Glenn D.; and Bennett, James G., 3,900,445.

Bentz, Francis: *See*—
Wolf, Gerhard Dieter; and Bentz, Francis, 3,900,448.

Berg, Bengt Frans Allan, to K A Bergs Smide AB. Safety hook. 3,899,806, Cl. 24-241.0PL.

Berger, Sol J. Coupon display and clip therefor. 3,899,841, Cl. 40-11.000.

Bergh, Gunnar; Brass, Kjell; Hessner, Jorgen; and Varberg, Thomas, to Sonnak Batterier A/S. Method of assembling storage batteries and injection mould for carrying out the method. 3,900,343, Cl. 136-134.00R.

Berkelhamer, Louis H.; and Schapira, William H., to North American Philips Corporation. Non hermetic sealed linear trimming potentiometer. 3,900,818, Cl. 338-176.000.

Berkey-Colortran, Inc.: *See*—
Tichenor, Clyde L., 3,900,726.

Berkhouse, Thomas W., to International Paper Company. Dispenser carton. 3,900,158, Cl. 229-17.00S.

Berman, Herbert M.; and Hooper, Ira, to Composite Construction Systems, Inc. Construction form support member. 3,900,182, Cl. 249-24.000.

Bertin & Cie: *See*—
Bertin, Jean Henri, 3,900,079.

Bertin, Jean Henri, to Bertin & Cie. Ground effect machine pressure fluid cushion confining walls. 3,900,079, Cl. 180-121.000.

Bertrams, Johannes Kurt, deceased; and by Mulkens, Casper Antonius Henricus, administrator, to U.S. Philips Corporation. Skirting board. 3,900,240, Cl. 339-21.00R.

Bertrand, Pierre; and Nony, Maurice, to Compteurs Schlumberger. Pneumatic controllers. 3,899,959, Cl. 92-100.000.

Besant, Robert W.: *See*—
Barclay, Francis W.; Frey, J. Richard; Wilson, James N.; and Besant, Robert W., 3,900,365.

Bethany, Lewis R.; Desmonds, Daniel J.; and Tate, Donald P., to Control Data Corporation. Apparatus for controlling computer pipelines for arithmetic operations on vectors. 3,900,723, Cl. 235-156.000.

Bethlehem Steel Corporation: *See*—
Seeburger, Thomas A., 3,900,282.

Bevis, Paul A.: *See*—
Bartlett, Fred J.; Bevis, Paul A.; Hoyt, Hazen L., III; and Mercer, Francis T., 3,900,405.

Beyer, Lewis R. Heated tool for heading plastic studs. 3,900,714, Cl. 219-229.000.

Beyl, Volker: *See*—
Voss, Peter; Niederprum, Hans; and Beyl, Volker, 3,900,508.

Biddell, William G.: *See*—
Krackeler, Joseph J.; and Biddell, William G., 3,900,533.

Biland, Hans Rudolf: *See*—
Luethi, Christian; Biland, Hans Rudolf; and Duennenberger, Max, 3,900,443.

Billeter, Henry R., to Sloan Valve Company. Automatic double-acting slack adjuster. 3,900,086, Cl. 188-202.000.

Bisker, Richard Gordon: *See*—
Giardini, Virgil Victor; and Bisker, Richard Gordon, 3,900,056.

Bjushgens, Georgy Sergeevich: *See*—
Tupolev, Andrei Nikolaevich; Tupolev, Alexei Andreevich; Minkner, Kurt Vladimirovich; Bonin, Alexandr Romanovich; Cheremukhin, Georgy Alexeevich; Bliznjuk, Valentin Ivanovich; Pukhov, Alexandr Leonidovich; Svischev, Georgy Petrovich; Bjushgens, Georgy Sergeevich; Nikolaev, Alexandr Vasilievich; and Mikeladze, Vitaly Georgievich, 3,900,178.

Black, Sigmund: *See*—
Banerjee, Bani R.; Gangal, Mukund D.; and Black, Sigmund, 3,899,893.

Blackman, Maurice R. Wrapper for bread and the like. 3,900,161, Cl. 229-87.00B.

Blair, Gerald E.: *See*—
Parsons, William F.; Blair, Gerald E.; and Maier, Clarence C., 3,900,328.

Blanton, Bobby D.; and Shepherd, Glen C., to Texas Instruments Incorporated. Automatic defrosting control system. 3,899,895, Cl. 62-155.000.

BLH Electronics, Inc.: *See*—
Lage, David A.; and Senour, Donald A., 3,900,828.

Bliznjuk, Valentin Ivanovich: *See*—
Tupolev, Andrei Nikolaevich; Tupolev, Alexei Andreevich; Minkner, Kurt Vladimirovich; Bonin, Alexandr Romanovich; Cheremukhin, Georgy Alexeevich; Bliznjuk, Valentin Ivanovich; Pukhov, Alexandr Leonidovich; Svischev, Georgy Petrovich; Bjushgens, Georgy Sergeevich; Nikolaev, Alexandr Vasilievich; and Mikeladze, Vitaly Georgievich, 3,900,178.

Blohm, Thomas R.: *See*—
Griser, Johann Martin; and Blohm, Thomas R., 3,900,565.

Blomquist, Seppo Ilmari: *See*—
Tuovinen, Frans Heikki; Blomquist, Seppo Ilmari; Heikkila, Risto Markus; Honkasalo, Jorma Bruno; and Kunttu, Kalevi Johan, 3,900,117.

BMR Security Products Corporation: *See*—
Walters, Russell W., 3,899,905.

Bock, Joseph J.; and Dunham, William S., to Sperry Rand Corporation. Apparatus and method for pulse tracker ranging equipment with increased resolution. 3,900,868, Cl. 343-7.300.

Boehringer Ingelheim GmbH: *See*—
Konz, Wilhelm; Waldeck, Franz; and Jennewein, Hans-Michael, 3,900,566.

Boeing Company, The: *See*—
Wright, Willard E.; and Tweeddale, Andrew D., 3,899,987.

Boerger, David H.; Krugler, Allen D., Jr.; and Willoughby, Donald A., to Ford Motor Company. By-pass suction throttling valve in a refrigeration system. 3,899,897, Cl. 62-196.000.

Boggs, Weldon C., to Food Research & Equipment Co. Method of removing crumbs from cooking oil. 3,900,580, Cl. 426-417.000.

Bogusch, Renate: *See*—
Hohne, Karl; and Bogusch, Renate, 3,900,342.

Bok, Edward. Pen with ink injection system. 3,900,268, Cl. 401-230.000.

Bolotin, Josif Mironovich: *See*—
Tjutjunnikov, Anatoly Borisovich; Tjutjunnikov, Boris Nikanorovich; Marchenko, Alexandr Nikolaevich; Burin, Viktor Leontievich; Bolotin, Josif Mironovich; Drozdov, Anatoly Sergeevich; Koval, Leonid Petrovich; Didenko, Zoya Vasilievna; Ljubushkin, Georgy Vasilievich; Budnik, Jury Mikhailovich; Moskvin, Vladimir Dmitrievich; and Bolyanovsky, Dmitry Mikhailovich, 3,900,537.

Bolyanovsky, Dmitry Mikhailovich: *See*—
Tjutjunnikov, Anatoly Borisovich; Tjutjunnikov, Boris Nikanorovich; Marchenko, Alexandr Nikolaevich; Burin, Viktor Leontievich; Bolotin, Josif Mironovich; Drozdov, Anatoly Sergeevich; Koval, Leonid Petrovich; Didenko, Zoya Vasilievna; Ljubushkin, Georgy Vasilievich; Budnik, Jury Mikhailovich; Moskvin, Vladimir Dmitrievich; and Bolyanovsky, Dmitry Mikhailovich, 3,900,537.

Bonin, Alexandr Romanovich: *See*—
Tupolev, Andrei Nikolaevich; Tupolev, Alexei Andreevich; Minkner, Kurt Vladimirovich; Bonin, Alexandr Romanovich; Cheremukhin, Georgy Alexeevich; Bliznjuk, Valentin Ivanovich; Pukhov, Alexandr Leonidovich; Svischev, Georgy Petrovich; Bjushgens, Georgy Sergeevich; Nikolaev, Alexandr Vasilievich; and Mikeladze, Vitaly Georgievich, 3,900,178.

Borg-Warner Corporation: *See*—
Ivey, John S., 3,900,089.
Newton, Alwin B., 3,900,277.

Bosco, Joseph. Utility blade holder. 3,899,828, Cl. 30-151.000.

Bourges, Bernard M., to Societa Anonyme Poclain. Apparatus for adjusting the relative inclinations of pivotable members. 3,900,113, Cl. 212-35.0HC.

Bouvier, Pierre; and Schumperli, Max, to Electronique Marcel Dassault. Installation for measurement by radio-electric transmission of a distance between two stations. 3,900,873, Cl. 343-12.00R.

Bouweconomisch en Technologisch Adviesbureau B.V.: *See*—
Klapwijk, Dick, 3,900,541.

Bowen, James Harold; and Sollman, Kenneth John, to Union Carbide Corporation. Hydrodynamic drag reduction dispenser-metering system. 3,900,043, Cl. 137-101.210.

Bowkley, Ian G.; and Goff, Nigel J., to E. R. A. Patents Limited. Electrical capacitors. 3,900,773, Cl. 317-258.000.

Boyce, Thomas E.: *See*—
Casey, Richard C.; Duggan, Robert J.; Grosky, Stephen A.; Jen, Dixson Teh-Chao; Serra, John J.; Whitehead, Donald Shaffer; and Boyce, Thomas E., 3,900,834.

Boyd, John F.: *See*—
Dowling, Donald J.; and Boyd, John F., 3,900,826.

Bradbury, Wilburn F. Ski edge sharpener. 3,899,942, Cl. 76-89.000.

Bradley, Howard B., to Union Carbide Corporation. Manufacture of silicon metal from a mixture of chlorosilanes. 3,900,660, Cl. 427-248.000.

Bradstock, Richard L., to Adams Rite Manufacturing Company. Lock mechanism. 3,899,906, Cl. 70-139.000.

Brass, Kjell: *See*—
Bergh, Gunnar; Brass, Kjell; Hessner, Jorgen; and Varberg, Thomas, 3,900,343.

Brassard, Hans-Joachim A.; and Erkens, Andreas, to Akzona Incorporated. Method and apparatus for the measurement of crimp contraction. 3,899,927, Cl. 73-160.000.

Braun Aktiengesellschaft: *See*—
Koster, Manfred, 3,900,787.

Brennan, John J., to United Aircraft Corporation. Tantalum wire reinforced silicon nitride articles and method for making the same. 3,900,626, Cl. 428-110.000.

Brettschneider, Johannes: *See*—
Bundesen, Lorenz; Brettschneider, Johannes; and Knapp, Heinrich, 3,900,014.

Brewer Engineering Laboratories, Inc.: *See*—
Brewer, Given A., 3,900,812.

Brewer, Given A., to Brewer Engineering Laboratories, Inc. Strain gage transducer. 3,900,812, Cl. 338-2.000.

Bricout, Catherine, heir: *See*—
Bricout, Henri, deceased; Bricout, Marie, heir; Bricout, Didier, heir; Bricout, Catherine, heir; and Bricout, Veronique, heir, 3,900,137.

Bricout, Didier, heir: *See*—
Bricout, Henri, deceased; Bricout, Marie, heir; Bricout, Didier, heir; Bricout, Catherine, heir; and Bricout, Veronique, heir, 3,900,137.

Bricout, Henri, deceased; by Bricout, Marie, heir; by Bricout, Didier, heir; by Bricout, Catherine, heir; and by Bricout, Veronique, heir, to Societe d'Applications des Machines Motrices. Fluid distributor. 3,900,137, Cl. 222-309.000.

Bricout, Marie, heir: *See*—
Bricout, Henri, deceased; Bricout, Marie, heir; Bricout, Didier, heir; Bricout, Catherine, heir; and Bricout, Veronique, heir, 3,900,137.

Bricout, Veronique, heir: *See*—
Bricout, Henri, deceased; Bricout, Marie, heir; Bricout, Didier, heir; Bricout, Catherine, heir; and Bricout, Veronique, heir, 3,900,137.

Brimhall, George Henry, II. Ski pole locking assembly. 3,899,904, Cl. 70-58.000.

Brink, David L., to University of California, The Regents of the. Lignocellulosic molding method and product. 3,900,334, Cl. 106-163.000.

Brisbane, Arthur P.: *See*—
Chatten, Clarence K.; Eller, Saul A.; Folb, Reece; and Brisbane, Arthur P., 3,899,991.

Brocart, Alain, to Societe Nationale des Poudres et Explosifs. Ignition device for explosive charges. 3,899,973, Cl. 102-27.00R.

Brockelsby, Norman D., to Dutton-Lainson Company. Winch mount and plate with coupler ball adapter. 3,900,214, Cl. 280-414.00R.

Broghammer, Werner, to Dual Gebruder Steidinger. Operating mode switch for different type of tapes. 3,900,889, Cl. 360-69.000.

Brokmeier, Dieter: *See*—
Hoppe, Peter; Drouven, Gustav; Wandel, Martin; Gutschik, Ernst; and Brokmeier, Dieter, 3,900,651.

Brollo, Aurelio: *See*—
Angioletti, Attilio; and Brollo, Aurelio, 3,900,627.

Bronn, William R.: *See*—
Banitt, Elden H.; and Bronn, William R., 3,900,481.

Brooks, Dean P.: *See*—
White, Allen A.; Garrison, Harold Keith; and Brooks, Dean P., 3,899,966.

Brosh, Amnon: *See*—
Kurtz, Anthony D.; Brosh, Amnon; Gravel, Charles L.; and Mallon, Joseph R., 3,900,811.

Brother Kogyo Kabushiki Kaisha: *See*—
Fukao, Satoshi, 3,900,712.

Browatzki, Kurt: *See*—
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Platz, Stephan; Friedsam, Josef; Schweicher, Wolfgang; Behr, Rolf; Wasser, Willi; and Browatzki, Kurt, 3,900,326.

Brown, Derek James: *See—*
Chadwick, Michael Dickenson; Jackson, Peter Woodall; and Brown, Derek James, 3,900,148.

Brown, John F., Jr., to General Electric Company. Miniature probe containing multifunctional electrochemical electrodes. 3,900,382, Cl. 204-195.00M.

Brown, Omar L., to Fraze, Ermal C. Easy open can end resistant to pressure. 3,900,128, Cl. 220-269.000.

Brown, R. G., to Council of the London Borough of Hounslow, The. Sound insulating window. 3,899,861, Cl. 52-616.000.

Brown & Root, Inc.: *See—*
Fowler, Oliver W., 3,900,146.

Brown & Williamson Tobacco Corporation: *See—*
Horsewell; Henry George; and Luke, John Anthony, 3,900,037.

Brueggemann, Walter H.; and Gilhart, Jack S., to Ferro Corporation. Catalytic crystalline glass fibers and method. 3,900,306, Cl. 65-33.000.

Brumlik, George C., to Ingrip Fasteners, Inc. Self-gripping device with preformed gripping elements. 3,899,803, Cl. 24-204.000.

Bruner, Ralph C., to Brunswick Corporation. Archery target mats of staggered corrugated plastic. 3,900,778, Cl. 273-102.00B.

Brunner, Friedrich C.: *See—*
Beck, Wolfgang; Brunner, Friedrich C.; Frasch, Peter U.; Ivancic, Blanka; Schwerdt, Friedrich W.; and Vogtmann, Theodor, 3,900,337.

Bruno, Anthony T.: *See—*
Speno, Martin J.; and Bruno, Anthony T., 3,900,392.

Brunswick Corporation: *See—*
Bruner, Ralph C., 3,900,778.

Bruschtein, Fabio B.; and Lyftgot, Dennis L., to Dow Chemical Company, The. Wallboard tape joint composition and adhesive therefor containing water soluble polyacrylamide, limestone, asbestos, mica and cellulose ether. 3,900,434, Cl. 260-17.00R.

Bryant, Samuel T., to Texas Instruments Incorporated. Automatic defrosting control system. 3,899,896, Cl. 62-155.000.

Bucher, Robert, to Sulzer Brothers Limited. Apparatus and method for supplying pile warp threads in a loom for weaving terry cloth. 3,900,051, Cl. 139-25.000.

Buchser, William J., to Whirlpool Corporation. Thread adaptor. 3,900,220, Cl. 285-177.000.

Buck K. G., Firma: *See—*
Schiessl, Alois, 3,899,977.

Buckler, Robert Thomas; Hartzler, Harold Eugene; Hayao, Shin; and Nichols, Gust, to Miles Laboratories, Inc. Phenyl- and (substituted)-phenyl-1,2,3-triazole-alkanoic and -alkenoic acids. 3,900,492, Cl. 260-308.00A.

Buckles, Ernest J. Intrusion alarm control system. 3,900,841, Cl. 340-258.00R.

Bucy, Shawn G.; and Takacs, John, to Abex Corporation. Multichannel wideband oscillograph. 3,900,851, Cl. 346-49.000.

Budnik, Jury Mikhailovich: *See—*
Tjutjunnikov, Anatoly Borisovich; Tjutjunnikov, Boris Nikanorovich; Marchenko, Alexandr Nikolaevich; Burin, Viktor Leontievich; Bolotin, Josif Mironovich; Drozdov, Anatoly Sergeevich; Koval, Leonid Petrovich; Didenko, Zoya Vasilievna; Ljubushkin, Georgy Vasilievich; Budnik, Jury Mikhailovich; Moskvin, Vladimir Dmitrievich; and Bolyanovsky, Dmitry Mikhailovich, 3,900,537.

Buie, James L.: *See—*
McIver, George W.; and Buie, James L., 3,900,724.

Buisson, Marc Francois Bernard: *See—*
Stakic, Ratko; Buisson, Marc Francois Bernard; and Rousseau, Gilbert James, 3,899,883.

Bujas, Roke; and Ringot, Claude, to Commissariat a l'Energie Atomique. Process for making a fuel element for high temperature nuclear reactors. 3,900,358, Cl. 156-215.000.

Bundesen, Lorenz; Brettschneider, Johannes; and Knapp, Heinrich, to Robert Bosch G.m.b.H. Fuel metering device for internal combustion engines. 3,900,014, Cl. 123-119.00R.

Bunin, Morey, to Aniforms, Inc. Animated cartoon character and method. 3,899,848, Cl. 46-126.000.

Bunker-Ramo Corporation, The: *See—*
Casey, Richard C.; Duggan, Robert J.; Grosky, Stephen A.; Jen, Dixson Teh-Chao; Serra, John J.; Whitehead, Donald Shaffer; and Boyce, Thomas E., 3,900,834.
Lynch, Thomas H.; and Patten, Hudson T., III, 3,900,839.

Burba, Christian: *See—*
Drawert, Manfred; Griebsch, Eugen; Krieger, Bernhard; Schepp, Horst; and Burba, Christian, 3,900,436.

Burckhardt, Manfred H., to Daimler-Benz Aktiengesellschaft. Control valve for accumulator systems, especially for servo brakes of motor vehicles. 3,900,046, Cl. 137-596.000.

Burin, Viktor Leontievich: *See—*
Tjutjunnikov, Anatoly Borisovich; Tjutjunnikov, Boris Nikanorovich; Marchenko, Alexandr Nikolaevich; Burin, Viktor Leontievich; Bolotin, Josif Mironovich; Drozdov, Anatoly Sergeevich; Koval, Leonid Petrovich; Didenko, Zoya Vasilievna; Ljubushkin, Georgy Vasilievich; Budnik, Jury Mikhailovich; Moskvin, Vladimir Dmitrievich; and Bolyanovsky, Dmitry Mikhailovich, 3,900,537.

Burke, George K.; Raines, Kenneth; and Le Fevre, Robert J., to Burron Medical Products, Inc. Roller clamp for tubing. 3,900,184, Cl. 251-6.000.

Burke, Richard K.: *See—*
Oliver, Haven D.; Burke, Richard K.; Dobson, Herbert, Jr.; and Grant, Leon E., 3,900,401.

Burr, John F. Hoist conversion unit for small tractors. 3,900,185, Cl. 254-139.100.

Burron Medical Products, Inc.: *See—*
Burke, George K.; Raines, Kenneth; and Le Fevre, Robert J., 3,900,184.

Burtch, Kurt A.; and Lewis, James A., to Gulf & Western Manufacturing Company. Roll feed micro-adjustment indicator. 3,900,142, Cl. 226-100.000.

Buryan Associates: *See—*
Godsey, Frank W., Jr., 3,899,979.

Buser, Max: *See—*
Wyler, Eugen; and Buser, Max, 3,900,125.

Butterworth Manufacturing Company, Inc.: *See—*
Ryan, Richard A., 3,899,808.

Butti, Adriano; and Prino, Giuseppe, to Crinos Industria Farmacobiologica S.p.A. Mixed salts of polsulfuric esters of naturally occurring glycopeptides with metals and organic bases, and process for producing same. 3,900,458, Cl. 260-112.00R.

Buzynski, John E.: *See—*
Bell, C. Gordon; Buzynski, John E.; Kaman, Charles H.; and O'Loughlin, James F., 3,900,835.

Byerley, John J.: *See—*
Enns, Kurt; Byerley, John J.; and Beingessner, Clare J., 3,900,377.

Byrd, Charles F.; and Dailey, William. Collapsable Christmas tree apparatus. 3,900,637, Cl. 428-9.000.

Byron Jackson, Inc.: *See—*
Scott, Lyle B., 3,900,068.

Bystron, Bruno; Hoeber, W. Gerhard; and Goldammer, Georg, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Apparatus for automatically cutting garments. 3,899,949, Cl. 83-565.000.

C. Eugen Maier Metalverarbeitung GmbH: *See—*
Roller, Siegfried; and Idler, Gustav, 3,899,870.

Cahn, Robert P.: *See—*
Sheer, Charles; Korman, Samuel; Angier, Derek J.; and Cahn, Robert P., 3,900,762.

Calabro, John A.: *See—*
Calabro, Salvatore R.; Calabro, John A.; and Mich, Peter R., 3,900,842.

Calabro, Salvatore R.; Calabro, John A.; and Mich, Peter R., to Automated Technology Corporation. Remote automatic meter reading and control system. 3,900,842, Cl. 340-310.00A.

Calder, Peter Henry; Gupta, Prem Chandra; and Lewis, William James, to Rolls-Royce (1971) Limited. Jet propulsion powerplant. 3,900,177, Cl. 244-53.00R.

Calgon Corporation: *See—*
Rumpf, Regis Robert; Farley, David Elmer; and Guilbault, Lawrence James, 3,900,338.

Cam Gears Limited: *See—*
Adams, Frederick John, 3,899,890.

Cambridge Scientific Instruments Limited: *See—*
Kynaston, David; Tillett, Peter Irving; and Paden, Richard Stephen, 3,900,734.

Campbell Chain Company: *See—*
Fink, Richard H., 3,899,873.

Campbell, Claude E.: *See—*
Russell, Lowell L.; and Campbell, Claude E., 3,900,211.

Canada Wire and Cable Limited: *See—*
Bayles, Francis Derrick; Dudley, Michael Alan; and Metzler, John C., 3,900,701.

Canadian Marconi Company: *See—*
Gaudet, Fernand W., 3,900,700.

Canadian Patents and Development Limited: *See—*
Meadus, Frederick W.; Sparks, Bryan D.; and Puddington, Ira E., 3,900,317.

Canon Kabushiki Kaisha: *See—*
Sato, Tadashi; and Kubo, Shunichi, 3,900,003.
Taguchi, Tatsuya; and Iura, Yukio, 3,900,856.
Tanikoshi, Kinzi, 3,900,780.

Canon Seiki Kabushiki Kaisha: *See—*
Tanikoshi, Kinzi, 3,900,780.

Cantales, Joseph. Stackable plastic garbage can with integral top. 3,900,106, Cl. 206-519.000.

Caposell, Charles D.: *See—*
Marriott, Carroll L.; Patzer, Hans E.; Hall, Ronald D.; Caposell, Charles D.; and Klein, Aaron David, 3,900,353.

Caramanian, John A. Concrete surface treating material and method of treating concrete surfaces. 3,900,622, Cl. 427-445.000.

Carlet, Xavier: *See—*
Alric, Andre; Carlet, Xavier; Nozeran, Robert; and Gentet, Pierre, 3,900,785.

Carlson, Carl E.: *See—*
Delgrosso, Eugene J.; and Carlson, Carl E., 3,900,150.

Carlson, Guy C., Jr.; and Haak, Willard J., to Caterpillar Tractor Company. Radial piston fluid translating device with cylinder positioning means. 3,899,957, Cl. 91-490.000.

Caroli, Ignazio, to Seleniz-Industrie Elettroniche Associate S.p.A. Group-delay equalizer using a meander folded transmission line. 3,900,806, Cl. 333-28.00R.

Carpenter, Charles W., to Hercules Incorporated. Method for bonding pile yarns onto rigid thermoplastics. 3,900,354, Cl. 156-73.200.

Carrier, Vernon J. Castor for use with pile carpet. 3,899,801, Cl. 16-45.000.

Carriker, Roy C., to HMW Industries, Inc. Permanent magnet generator. 3,900,749, Cl. 310-156.000.

Carson, Bradley A.: *See—*
Rolker, John H.; and Carson, Bradley A., 3,900,320.

Casagrande, Cesare: *See—*
Ferrari, Giorgio; and Casagrande, Cesare, 3,900,564.

Casey, Richard C.; Duggan, Robert J.; Grosky, Stephen A.; Jen, Dixson Teh-Chao; Serra, John J.; Whitehead, Donald Shaffer; and Boyce, Thomas E., to Bunker-Ramo Corporation, The. Memory update apparatus utilizing chain addressing. 3,900,834, Cl. 340-172.500.

Cassidy, John Edward, to Imperial Chemical Industries Limited. Phosphatic materials. 3,900,331, Cl. 106-85.000.

Castaneda, Ben; and Staab, Norbert A. Surveyors tape repair tool. 3,899,818, Cl. 29-243.560.

Caterpillar Tractor Company: *See—*
Carlson, Guy C., Jr.; and Haak, Willard J., 3,899,957.
Crabb, Elmer R., 3,899,938.
Gee, James E.; and Fels, Harlan H., 3,900,077.
Smith, Duane R.; and Anderson, Rodney H., 3,900,227.
Unruh, Dale H.; and Proksch, Frederick D., 3,900,042.
Whitfield, Joseph A., 3,900,400.

Cayless, Maurice Arthur: *See—*
Mason, David Robert; Cole, Susan Margaret; Cayless, Maurice Arthur; and Wharmby, David Osborn, 3,900,754.

CBS Inc.: *See—*
Glenn, William E., Jr.; and Rutherford, Robert E., Jr., 3,900,760.

Celanese Corporation: *See—*
Clarke, Charles M., 3,900,556.

Centre de Recherches Metallurgiques: *See—*
Nilles, Paul Emile, 3,900,311.

Cerioli, Paolo: *See—*
Vignozzi, Pietro; and Cerioli, Paolo, 3,900,013.

Chadwick, Michael Dickenson; Jackson, Peter Woodall; and Brown, Derek James, to International Research and Development Company Limited. Explosive welding of submerged pipes. 3,900,148, Cl. 228-107.000.

Champion International Corporation: *See—*
Gaylord, Norman G., 3,900,685.

Chandley, George D.; and Lamb, John N., to Hitchiner Manufacturing Co., Inc. Metal casting. 3,900,064, Cl. 164-51.000.

Chang, Charles H., to GAF Corporation. Anthraquinone dyes containing a 2-aryloxy alkoxy carbamate moiety, their intermediates, and a process for their preparation. 3,900,472, Cl. 260-247.10A.

Chao, Hung-Chi; Gross, John H.; Judd, Robert R.; and Rueckl, Roger L., to United States Steel Corporation. Process for the production of high apparent density water atomized steel powders. 3,900,309, Cl. 75-0.5BA.

Chappelow, Cecil C., Jr.; and Engel, James F., to Kerr-McGee Corporation. N-cycloalkyl hydroxamic acids. 3,900,514, Cl. 260-500.50H.

Charvet, Eugene: *See—*
Riboulet, Robert; and Charvet, Eugene, 3,900,653.

Chatten, Clarence K.; Eller, Saul A.; Folb, Reece; and Brisbane, Arthur P., to United States of America, Navy. Weather resistant segmented fairing for a tow cable. 3,899,991, Cl. 114-235.00F.

Chatterji, Jiten; Holtmyer, Marlin D.; and Tiner, Robert L., to Halliburton Company. Gelling liquid hydrocarbons. 3,900,070, Cl. 166-308.000.

Chaudhuri, Kiranendu B., to Swiss Aluminum Ltd. Method of controlling the thickness of the lateral ledges in a cell for the electrolytic recovery of aluminum. 3,900,371, Cl. 204-67.000.

Chayamiti, Hiroshi: *See—*
Aishima, Itsuho; Fukuma, Noboru; Sakura, Hisaya; Chayamiti, Hiroshi; Okamoto, Toshio; Doi, Yuzuru; and Henmi, Hiroshi, 3,900,678.

Chemische Werke Huls Aktiengesellschaft: *See—*
Muller, Karl-Adolf; Gude, Armin; and Menzel, Gerhard, 3,900,607.

Chen, Wei-Gwo, to Griffolyn Company, Inc. Self-extinguishing composite laminate. 3,900,625, Cl. 428-110.000.

Cheremukhin, Georgy Alexeevich: *See—*
Tupolev, Andrei Nikolaevich; Tupolev, Alexei Andreevich; Minkner, Kurt Vladimirovich; Bonin, Alexandr Romanovich; Cheremukhin, Georgy Alexeevich; Bliznjuk, Valentin Ivanovich; Pukhov, Alexandr Leonidovich; Svischev, Georgy Petrovich; Bjushgens, Georgy Sergeevich; Nikolaev, Alexandr Vasilievich; and Mikeladze, Vitaly Georgievich, 3,900,178.

Cherry, Richard A.: *See—*
Williams, Roger B., Jr.; Loshbough, Richard C.; and Cherry, Richard A., 3,899,915.

Chevalier, Philippe; and Seeman, Bronislav, to Schlumberger Technology Corporation. Method and apparatus for stabilizing the gain of a photomultiplier. 3,900,731, Cl. 250-207.000.

Chevron Research Company: *See—*
Levine, Irving E., 3,900,288.
Meader, Arthur L., Jr.; and Runyon, William L., Jr., 3,900,687.

Chichester, Willard L.; and Holtkamp, Donald A., to Clark Equipment Company. Hydrostatic propulsion system. 3,900,075, Cl. 180-6.300.

Chikamura, Takao: *See—*
Fukai, Masakazu; Fujiwara, Shinji; Serizawa, Hiroyuki; Eguchi, Osamaru; Kuramoto, Yukimasa; and Chikamura, Takao, 3,900,882.

Childs, William V.; Ashe, Benedict H., Jr.; and Hudson, Paul S., to Phillips Petroleum Company. Recycle of acyl fluoride and electrochemical fluorination of esters. 3,900,372, Cl. 204-81.000.

Chisso Corporation: *See—*
Sato, Akihiro; Takeda, Saburo; Konotsune, Shiro; Kato, Mitsuru; and Tonoike, Takao, 3,900,454.

Christ, Alfred; Tognola, Sergio; and Lehmann, Rolf, to Escher Wyss GmbH. Blade for applying a flowable substance to a moving article. 3,899,999, Cl. 118-405.000.

Christensen, Carl W.; and Isaacson, Calvin M., to Shipley Company, Inc. Light sensitive quinone diazide composition with N-3-oxohydrocarbon substituted acrylamide. 3,900,325, Cl. 96-91.00D.

Christensen, Walter M.: *See—*
Stigler, Edward A., 3,900,570.

Christmann, Harold F.; and Teel, Paul H., to Petro-Tex Chemical Corporation. Manganese ferrite catalyzed oxidative dehydrogenation. 3,900,525, Cl. 260-680.00E.

Chruma, Jerry L.; and Hilton, Paul G., to Motorola, Inc. System and process for deposition of polycrystalline silicon with silane in vacuum. 3,900,597, Cl. 427-82.000.

Chupp, John Paul, to Monsanto Company. 1,2,3,5-Oxathiadiazolin-4-one,2-oxides. 3,900,484, Cl. 260-301.000.

Ciba-Geigy AG: *See—*
Kolliker, Hans Peter; Karlen, Urs; and Hindermann, Peter, 3,900,496.
Wegmann, Jacques; and Peter, Richard, 3,900,286.
Zographos, Georgeos; and Mockli, Peter, 3,900,318.

Ciba-Geigy Corporation: *See—*
Diel, Peter J.; and Schmid, Wolfgang, 3,900,473.
Habermeier, Jurgen; Batzer, Hans; and Porret, Daniel, 3,900,493.
Karrer, Friedrich; and Farooq, Saleem, 3,900,507.
Luethi, Christian; Biland, Hans Rudolf; and Duennenberger, Max, 3,900,443.
Rembold, Heinz; Haug, Theobald; Wyler, Sigfried; and Kiefer, Jurg, 3,900,449.
Schlapfer, Hans; and Kabas, Guglielmo, 3,900,419.
Woodward, Robert Burns, 3,900,500.

Ciko, John D., to BASF Wyandotte Corporation. Process for the removal of silver nitrate stains. 3,900,284, Cl. 8-109.000.

Cincinnati Milacron Chemicals Inc.: *See—*
Dalter, Raymond S.; and White, Sidney S., 3,900,409.

Cincinnati Milacron, Inc.: *See—*
Haggerty, William Andrew, 3,900,374.

Cities Service Oil Company: *See—*
Hulsebos, Jan, 3,900,314.

Citizen Watch Co., Ltd.: *See—*
Tanabe, Koji, 3,900,095.

Clampitt, Richard L.; and Hessert, James E., to Phillips Petroleum Company. Aqueous gels and uses thereof. 3,900,406, Cl. 252-8.55C.

Clare, Michael A., to Sidcor, Inc. Brake released accelerator holder. 3,900,087, Cl. 192-3.00T.

Clark, Alexander B., Jr. Corner pad. 3,900,156, Cl. 229-14.00C.

Clark Equipment Company: *See—*
Chichester, Willard L.; and Holtkamp, Donald A., 3,900,075.

Clark, Richard J.: *See—*
Mott, Claude M.; and Clark, Richard J., 3,900,259.

Clarke, Charles M., to Celanese Corporation. Process for the continuous carbonization and graphitization of a stabilized acrylic fibrous material. 3,900,556, Cl. 423-447.000.

Class, Gottfried, to Gesellschaft fur Kernforschung m.b.H. Restraint system for core elements of a reactor core. 3,900,367, Cl. 176-87.000.

Clayton Manufacturing Company: *See—*
Cline, Edwin Lee, 3,899,916.

Clements, Alwin S.: *See—*
Metcalfe, Kenneth A.; and Clements, Alwin S., 3,900,413.

Clifford, Graham F.; and Spurrier, Mack W., to Gaston County Dyeing Machine Co. Means for transferring yarn packages from a winding tube to a core for dyeing. 3,899,817, Cl. 29-234.000.

Cline, Edwin Lee, to Clayton Manufacturing Company. Recorder and computer type brake analyzer and method. 3,899,916, Cl. 73-126.000.

Clipstone, Colin John: *See—*
Curry, Francis Russell; and Clipstone, Colin John, 3,900,636.

Cluaran Associates Ltd.: *See—*
Becker, John E., 3,899,887.

Clyde, Robert A. Method of plating metal uniformly on and throughout porous structures. 3,900,646, Cl. 427-55.000.

Coaxial Dynamics: *See—*
Stevens, Harold E., 3,900,805.

Cochran, Michael J.; and Grant, Charles P., Jr., to Texas Instruments Incorporated. Multi-chip calculator system having cycle and subcycle timing generators. 3,900,722, Cl. 235-152.000.

Coffman, Alfred M., to B. F. Goodrich Company, The. Interpolymers of alkyl acrylates, unsaturated carboxylic acids and unsaturated hydroxylated amides as pressure-sensitive adhesives and articles thereof. 3,900,674, Cl. 428-355.000.

Cohen, Arthur I.: *See—*
Sim, James S. Y.; Van Horn, Maurice H.; Cohen, Arthur I.; Gordesky, Stanley E.; and Gordon, Stanley I., 3,900,559.

Cohen, Noal; De Silva, Wijitha; and Hueppi, Gerhard, to Hoffmann-La Roche Inc. 7-Oxa-3-thia-1-aza spiro[5,5]undec-1-ene. 3,900,469, Cl. 260-243.00R.

Colaguori, Albert C.: *See—*
Anderl, Josef H.; and Colaguori, Albert C., 3,900,772.

Cole, Susan Margaret: *See—*
Mason, David Robert; Cole, Susan Margaret; Cayless, Maurice Arthur; and Wharmby, David Osborn, 3,900,754.

Colgate-Palmolive Company: *See—*
Kaufman, Benjamin, 3,900,407.
Kirk, Lawrence J.; and Baldwin, Marshall G., 3,900,059.

Collier, Robert Jacob; and Herriott, Donald Richard, to Bell Telephone Laboratories, Incorporated. Electron beam exposure system. 3,900,737, Cl. 250-492.00A.

Collins, Keith Douglas, to Lucas Aerospace Limited. Spark ignition systems for internal combustion engines. 3,900,017, Cl. 123-148.00E.

Combustion Engineering, Inc.: *See*—
Stiteler, Fred Zwald; and Honigmann, Ronald Louis, 3,900,010.

Comitato Nazionale per l'Energia Nucleare: *See*—
Bardoncelli, Franco; and Grossi, Giuseppe, 3,900,551.

Commissariat a l'Energie Atomique: *See*—
Bujas, Roke; and Ringot, Claude, 3,900,358.

Commonwealth of Australia, The: *See*—
Metcalfe, Kenneth A.; and Clements, Alwin S., 3,900,413.

Commonwealth Scientific and Industrial Research Organization: *See*—
Mole, Thomas; and Meisters, Aivars, 3,900,505.

Composite Construction Systems, Inc.: *See*—
Berman, Herbert M.; and Hooper, Ira, 3,900,182.

Compteurs Schlumberger: *See*—
Bertrand, Pierre; and Nony, Maurice, 3,899,959.

Compton, William A.; Duffy, Thomas E.; and Seegall, Manfred I., to International Harvester Company. Apparatus for indicating gas temperatures. 3,899,878, Cl. 60-39.28T.

Conner, Jack S., to Northrop Corporation. Expendable self-powered target with stabilizing control. 3,900,198, Cl. 273-105.400.

Conner, William R., Jr., to Stahl-Urban Company. Apparatus for guiding limp material. 3,899,986, Cl. 112-214.000.

Consolidated Video Systems: *See*—
Tallent, Michael W.; Hendershot, William B.; Swain, Allan L.; and Harrison, Ronnie M., 3,900,885.

Constantinescu, Petre; Oachis, Emil; Trimbitas, Dorin; and Alexandrescu, Doina, to Intreprinderea Metalul Rosu Cluj. Air treatment apparatus. 3,900,301, Cl. 55-257.000.

Constructions Navales et Industrielles de la Mediterranee (C.N.I.M.): *See*—
Labruyere, Jean Edmond, 3,899,953.

Conti, Fulvio. Plant for steaming and fixing dyes at high or low temperature on printed or dyed fabrics. 3,899,902, Cl. 68-5.00D.

Continental Can Company, Inc.: *See*—
Harned, Frederick G., 3,900,104.

Continental Oil Company: *See*—
Beaty, William Ralph, Jr., 3,900,430.
Haden, Elard L., 3,899,926.

Control Data Corporation: *See*—
Bethany, Lewis R.; Desmonds, Daniel J.; and Tate, Donald P., 3,900,723.

Controlled Acoustics, Inc.: *See*—
Benedict, Charles E.; and Oliver, Calvin C., 3,900,052.

Cook, Charles A.; and Hajduk, Thaddeus J., to Zenith Radio Corporation. Apparatus for application of lacquer coating to cathode ray tube panels. 3,899,994, Cl. 118-6.000.

Cook, John F. Continuously-variable-gear-ratio automatic transmission. 3,899,941, Cl. 74-781.00R.

Cooper, Albert S., Jr.: *See*—
St. Mard, Hubert H.; Cooper, Albert S., Jr.; and Hamalainen, Carl, 3,900,666.

Cooper, Glenn D.; and Bennett, James G., to General Electric Company. Process for the preparation of polyphenylene ethers with cuprous and cupric amine catalyst. 3,900,445, Cl. 260-47.0ET.

Coors, George T.: *See*—
Hardwick, David R.; and Coors, George T., 3,900,822.

Copeland, Andrew P. Boot. 3,900,224, Cl. 296-23.0MC.

Copeland, T. D.: *See*—
Selch, Howard I., 3,899,955.

Copsey, Mervyn John; and Wilby, Brian Hanson, to Electricity Council, The. Cleaning of metal surfaces. 3,900,376, Cl. 204-141.500.

Corbett, Dennis Thomas; and Wilson, John, to Hemlab AG. Particulate matter suppression using a solution of a surfactant and a polymer. 3,900,611, Cl. 427-214.000.

Cordea, James N.: *See*—
Lorenzetti, James J.; and Cordea, James N., 3,900,347.

Corning Glass Works: *See*—
DeLuca, Robert D., 3,900,305.
Herczog, Andrew; Layton, Margaret M.; and Rice, Dale W., 3,900,593.
Kaukeinen, Ralph M., 3,900,546.

Cosden Oil & Chemical Company: *See*—
Wiley, Donald F., 3,900,548.

Costales, John E., to Litton Systems, Inc. Encoder disc mount and aligning tool. 3,900,732, Cl. 250-231.0SE.

Costas, Louis P., to Anaconda Company, The. Silicon brass resistant to parting corrosion. 3,900,349, Cl. 148-32.000.

Council of the London Borough of Hounslow, The: *See*—
Brown, R. G., 3,899,861.

Cowden, Ernest A.: *See*—
Lauber, Leo E.; and Cowden, Ernest A., 3,900,024.

Coyle, Jan R.; and Stevens, Robert W. Sonic color system. 3,900,886, Cl. 358-82.000.

Crabb, Elmer R., to Caterpillar Tractor Company. Planetary torque proportional differential. 3,899,938, Cl. 74-710.500.

Crawford, Donald C.: *See*—
Nack, Michael R.; and Crawford, Donald C., 3,900,096.

Crawford, Howard H. Plate type nail holder for edgers, trimmers, or other applications. 3,900,071, Cl. 172-15.000.

Crawford, James E., to Owens-Illinois, Inc. Method for forming graft copolymers employing the reaction product of hydrogen peroxide and ethylene-acrylic acid alkali salt copolymers. 3,900,530, Cl. 260-877.000.

Cricchio, Renato; and Lancini, Giancarlo, to Gruppo Lepetit, S.p.A. 3-Formylrifamycin azines. 3,900,465, Cl. 260-239.30P.

Crinos Industria Farmacobiologica S.p.A.: *See*—
Butti, Adriano; and Prino, Giuseppe, 3,900,458.

Cristiani, Franco: *See*—
Bellasio, Elvio; and Cristiani, Franco, 3,900,515.

Crone, Alfred F., to Acme Highway Products Corporation. Joint forming seal assembly. 3,900,271, Cl. 404-68.000.

Crum, William Norman. Earth working device with predetermined grade indicating assembly. 3,900,073, Cl. 172-430.000.

Cunha, Joseph J., to Overhead Door Corporation. Adjustable king pin. 3,900,213, Cl. 280-407.000.

Curry, Francis Russell; and Clipstone, Colin John, to Gillette Company, The. Method of treating cutting edges. 3,900,636, Cl. 427-38.000.

Curtiss, Walter W., Jr., to Goodyear Tire & Rubber Company, The. Method of fabricating large tires. 3,900,061, Cl. 152-352.000.

Cutler-Hammer, Inc.: *See*—
Smith, Charles E.; Hink, Karl M.; Greening, Donald J., deceased; and Greening, Dorothy, executrix, 3,900,781.

Dachs, Martin R. Optical communication system. 3,900,404, Cl. 250-199.000.

Dai-Ichi Kogyo Seiyaku Co. Ltd.: *See*—
Yada, Akira; and Hori, Yuji, 3,900,463.

Dai Nippon Toryo Co., Ltd.: *See*—
Makishima, Hiroshi; Shinohara, Toshio; Kawahara, Yukio; Nii, Hiroshi; and Ebine, Setsuo, 3,900,630.

Daikin Kogyo Co., Ltd.: *See*—
Fujii, Tuneo; and Nakamura, Yukiharu, 3,900,658.

Dailey, William: *See*—
Byrd, Charles F.; and Dailey, William, 3,900,637.

Daimler-Benz Aktiengesellschaft: *See*—
Burckhardt, Manfred H., 3,900,046.

Dainichieseika Color & Chemicals Mfg. Co., Ltd.: *See*—
Kawamura, Kimihide; and Horiguchi, Shojiro, 3,900,459.

Dale Electronics, Inc.: *See*—
Person, Herman R., 3,900,767.

D'Alelio, Gaetano F. Halogenated esters of phosphorus-containing acids. 3,900,536, Cl. 260-952.000.

Dalter, Raymond S.; and White, Sidney S., to Cincinnati Milacron Chemicals Inc. Lubricating oil compositions containing sulfurchlorinated styrene derivatives. 3,900,409, Cl. 252-48.800.

Daly, William M.: *See*—
United States of America, National Aeronautics and Space Administration; Daly, William M.; and McKenna, John F., Jr., 3,900,741.

D'Amato, Salvatore F.; Kimball, John J.; and Lednicer, Oliver, to American Bank Note Company. Document having a concealed marking and method of making same. 3,900,219, Cl. 283-6.000.

Dapkus, Paul Daniel; Dixon, Richard Wayne; and Weick, Walter Werner, to Bell Telephone Laboratories, Incorporated. Monolithic led displays. 3,900,864, Cl. 357-18.000.

Darlington, Henry S., to Teledyne Mid-America Corporation. Child resistant closure for collapsible tube. 3,900,123, Cl. 215-216.000.

Davies, John; and Skinner, Dennis E., to USM Corporation. Rotary coating applying nozzles. 3,899,998, Cl. 118-323.000.

Davis, Benjamin; and Pearce, Derek Roger, to Glaxo Laboratories Limited. Pharmaceutical compositions. 3,900,561, Cl. 424-238.000.

Davis, Billy W., to Schlumberger Technology Corporation. Method for making a foam seismic streamer. 3,900,543, Cl. 264-45.300.

Davis, Jack W.; and Walch, Allan P., to United Aircraft Corporation. Multitube coaxial closed cycle gas laser system. 3,900,804, Cl. 331-94.50T.

Davis, Matthew L. Lightweight cement compositions for building and other purposes. 3,900,332, Cl. 106-97.000.

Day, Robert H., to Illinois Tool Works Inc. Packages of containers. 3,900,103, Cl. 206-431.000.

De la Rue Giori S.A.: *See*—
Giori, Gualtiero, 3,900,595.

Deacon, Brian Matthew: *See*—
Maheux, Peter Francis; and Deacon, Brian Matthew, 3,900,242.

de Courcy, Rowland J. J., to Douglas-Rownson Limited. Live roller conveyor. 3,900,097, Cl. 198-127.00R.

Deering Milliken Research Corporation: *See*—
Lesley, Bascum G., 3,899,901.

Dehnert, Johannes, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Water-soluble disazo compounds containing a pyrazole component. 3,900,460, Cl. 260-160.000.

de Jong, Lodewikus N. J., to Shell Oil Company. Hydraulic mining method. 3,900,226, Cl. 299-17.000.

Delage, Pierre: *See*—
Poignant, Pierre; and Delage, Pierre, 3,900,308.

DeLeon, Walter L., to United States Steel Corporation. Plate length measuring gage. 3,899,831, Cl. 33-141.00B.

Delgrosso, Eugene J.; and Carlson, Carl E., to United Aircraft Corporation. Duplex composite tape. 3,900,150, Cl. 228-185.000.

DeLuca, Robert D., to Corning Glass Works. Method of forming conductive layer on oxide-containing surfaces. 3,900,305, Cl. 65-30.000.

Demerson, Christopher A.: *See*—
Philipp, Adolf H.; Demerson, Christopher A.; and Humber, Leslie G., 3,900,477.

Demoulin, Pierre: *See*—
Plumat, Emile; and Demoulin, Pierre, 3,900,634.

Denki Onkyo Company, Ltd.: *See*—
Kawada, Takehiko, 3,900,766.

Masuda, Noboru; and Takiguchi, Hisashi, 3,900,813.
Masuda, Noboru, 3,900,814.

Dennison Manufacturing Company: *See*—
Dudley, John S., 3,899,971.

De Silva, Wijitha: *See*—
Cohen, Noal; De Silva, Wijitha; and Hueppi, Gerhard, 3,900,469.

Desmonds, Daniel J.: *See*—
Bethany, Lewis R.; Desmonds, Daniel J.; and Tate, Donald P., 3,900,723.

Deutsch, Ralph: *See*—
Griffith, Glen R.; and Deutsch, Ralph, 3,899,951.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
von Bebenburg, Walter; and Offermanns, Heribert, 3,900,466.

DeVries, Vern Gordon: *See*—
Allen, George Rodger, Jr.; McEvoy, Francis Joseph; DeVries, Vern Gordon; Moran, Daniel Bryan; and Littell, Ruddy, 3,900,495.
Allen, George Rodger, Jr.; McEvoy, Francis Joseph; De Vries, Vern Gordon; Moran, Daniel Bryan; and Littell, Ruddy, 3,900,563.

Deyrup, Alden J., to du Pont de Nemours, E. I., and Company. Substrates treated with chromium(III) complexes to increase the adhesion of organic polymers thereto. 3,900,689, Cl. 428-432.000.

Dhoble, Prafulla S., to Xerox Corporation. Xerographic fusing apparatus. 3,900,590, Cl. 427-22.000.

Diamond Shamrock Corporation: *See*—
Beckers, Norman L., 3,900,524.

DiBiasio, Vincent L.: *See*—
Holdsworth, Robert S.; O'Neill, Gerald J.; Simons, Charles W.; and DiBiasio, Vincent L., 3,900,568.

Dichter, Hans-Joachim. Containers with stoppers. 3,900,122, Cl. 215-31.000.

Dickinson, William B.; and Vaupotic, Marcia P., to Sterling Drug Inc. N-(2-pyridyl)-1-polymethyleneiminothiocarboxamides. 3,900,480, Cl. 260-293.690.

Didenko, Zoya Vasilievna: *See*—
Tjutjunnikov, Anatoly Borisovich; Tjutjunnikov, Boris Nikanorovich; Marchenko, Alexandr Nikolaevich; Burin, Viktor Leontievich; Bolotin, Josif Mironovich; Drozdov, Anatoly Sergeevich; Koval, Leonid Petrovich; Didenko, Zoya Vasilievna; Ljubushkin, Georgy Vasilievich; Budnik, Jury Mikhailovich; Moskvin, Vladimir Dmitrievich; and Bolyanovsky, Dmitry Mikhailovich, 3,900,537.

Diel, Peter J.; and Schmid, Wolfgang, to Ciba-Geigy Corporation. Quinoxaline-di-N-oxide derivatives. 3,900,473, Cl. 260-250.00Q.

Diena, Alberto: *See*—
Lancini, Giancarlo; Lazzari, Ettore; and Diena, Alberto, 3,900,567.

Diepeveen, John C. Apparatus for incremental movement of die frame. 3,900,145, Cl. 228-4.100.

Dierkes, Hubert; Schonol, Karl; Walter, Joachim; and Muller, Friedhelm, to Bayer Aktiengesellschaft. Preparations of optical brighteners. 3,900,608, Cl. 427-158.000.

Dietrich, Isolde: *See*—
Zerbst, Helmut; Weyl, Reinhard; and Dietrich, Isolde, 3,900,808.

Dietrich, Manfred; Schnetger, Jochen; Haas, Friedrich; Marwede, Gunter; and Appel, Hansgunter, to Bayer Aktiengesellschaft. Low viscosity pasty rubber compositions. 3,900,532, Cl. 260-879.000.

Dietze, Wolfgang; Schnoller, Manfred; Mladenovich, Tomislav; and Baumgartner, Werner, to Siemens Aktiengesellschaft. Method of producing shaped semiconductor bodies. 3,900,039, Cl. 134-3.000.

Digital Equipment Corporation: *See*—
Bell, C. Gordon; Buzynski, John E.; Kaman, Charles H.; and O'Loughlin, James F., 3,900,835.

Dilworth, John Lewis, to McCulloch Corporation. Diaphragm pump method and apparatus. 3,900,276, Cl. 417-542.000.

Director-General of the Agency of Industrial Science and Technology: *See*—
Terajima, Kazuki; Tomita, Shigeru; Matsuda, Yoshindo; and Abe, Keiji, 3,900,422.

Di Salvo, Ronald M.; and Yates, Robert W., to RedKen Laboratories. Method and apparatus for analyzing hair structure. 3,900,252, Cl. 353-39.000.

Distribution Supply Corporation: *See*—
Jennings, Donald G., 3,899,816.

Dixon, Richard Wayne: *See*—
Dapkus, Paul Daniel; Dixon, Richard Wayne; and Weick, Walter Werner, 3,900,864.

Djorup, Robert S., to Environmental Instruments, Inc. Thermal directional fluid flow transducer. 3,900,819, Cl. 338-320.000.

Doble, James W. Convertible utility cart. 3,900,202, Cl. 280-8.000.

Dobson, Herbert, Jr.: *See*—
Oliver, Haven D.; Burke, Richard K.; Dobson, Herbert, Jr.; and Grant, Leon E., 3,900,401.

Doi, Haruo: *See*—
Komatsu, Noboru; Kamigaito, Osami; Suzuki, Takatoshi; Doi, Haruo; Sano, Kazuya; Yamamoto, Nobuyuki; Kandori, Toshio; and Tsuzuki, Yukikazu, 3,900,429.

Doi, Kikuo: *See*—
Kimura, Masakazu; Nanamatsu, Satoshi; Doi, Kikuo; and Matsushita, Shigeo, 3,900,246.

Doi, Yuzuru: *See*—
Aishima, Itsuho; Fukuma, Noboru; Sakura, Hisaya; Chayamiti, Hiroshi; Okamoto, Toshio; Doi, Yuzuru; and Henmi, Hiroshi, 3,900,678.

Doman, David G.: *See*—
Hamer, Brian; and Doman, David G., 3,900,054.

Domenighetti, Domenico. Compacting machine with movable ballast. 3,900,272, Cl. 404-130.000.

Douglas-Rownson Limited: *See*—
de Courcy, Rowland J. J., 3,900,097.

Dow Chemical Company, The: *See*—
Anderson, Richard W.; and Frick, Hughie R., 3,900,380.
Bashan, Robert N., 3,900,030.
Bruschtein, Fabio B.; and Lyftgot, Dennis L., 3,900,434.
Dunbar, Joseph E.; and Rogers, Joan H., 3,900,471.
Dunn, James L., Jr., 3,900,615.
Kuchek, Henry A., 3,900,296.
Lalk, Robert H.; Schmidt, Donald L.; and Thomas, Mary R., 3,900,619.
Markley, Lowell D., 3,900,509.
McMillan, William J., 3,899,805.
Mitchell, Albertha B.; McKinley, Suzanne V.; and Rakshys, Joseph W., Jr., 3,900,451.
Moore, Carl, 3,900,616.
Oliver, Bruce L.; and Heinemeyer, Ben W., 3,900,550.
Schlosser, James A.; and Trumbull, Walter A., 3,899,913.

Dow Corning Corporation: *See*—
Vincent, Gary A., 3,900,416.

Dowling, Donald J.; and Boyd, John F., to Texaco Inc. Acoustic permeability log utilizing differential travel time measurements. 3,900,826, Cl. 340-15.5TN.

Downing, Noel L., to General Motors Corporation. Turbine engine fuel control. 3,899,879, Cl. 60-39.28R.

Doyle, Robert L.; and Swezy, Montgomery C., to Western Progress, Inc. Signalling device with a sign having provision for spilling of wind and with a support. 3,899,843, Cl. 40-125.00G.

Doyle, Robert O.; Kirsch, Jordan; and Thomis, Wendl, to Super 8 Sound, Inc. Synchronizer system for a motion picture sound recorder. 3,900,251, Cl. 352-12.000.

Dr..ft Meter Corporation: *See*—
Paranto, Archie V., 3,900,136.

Drawert, Manfred; Griebsch, Eugen; Krieger, Bernhard; Schepp, Horst; and Burba, Christian, to Schering Aktiengesellschaft. Polyesteramide resin. 3,900,436, Cl. 260-18.00N.

Drayer, Dennis E.: *See*—
Kersch, Keith M.; Pouska, George A.; Drayer, Dennis E.; and Tackett, James E., Jr., 3,900,041.
Merrill, La Vaun S., Jr.; Drayer, Dennis E.; Gogarty, William B.; and Pouska, George A., 3,900,391.

Dresser Industries, Inc.: *See*—
Giardini, Virgil Victor; and Bisker, Richard Gordon, 3,900,056.
Wyant, Reece E., 3,899,833.

Drouven, Gustav: *See*—
Hoppe, Peter; Drouven, Gustav; Wandel, Martin; Gutschik, Ernst; and Brokmeier, Dieter, 3,900,651.

Drozdov, Anatoly Sergeevich: *See*—
Tjutjunnikov, Anatoly Borisovich; Tjutjunnikov, Boris Nikanorovich; Marchenko, Alexandr Nikolaevich; Burin, Viktor Leontievich; Bolotin, Josif Mironovich; Drozdov, Anatoly Sergeevich; Koval, Leonid Petrovich; Didenko, Zoya Vasilievna; Ljubushkin, Georgy Vasilievich; Budnik, Jury Mikhailovich; Moskvin, Vladimir Dmitrievich; and Bolyanovsky, Dmitry Mikhailovich, 3,900,537.

Du Pont of Canada, Ltd.: *See*—
Jaswal, Iqbalsingh; and Pugi, Kalev, 3,900,450.

Dual Gebruder Steidinger: *See*—
Broghammer, Werner, 3,900,889.

Du Bato, Salvatore J. Inflatable Christmas tree ornament. 3,900,638, Cl. 428-11.000.

Dubs, Paul; Kuntzel, Heiner; and Pesaro, Mario, to Givaudan Corporation. 2-Thietanols and their preparation. 3,900,498, Cl. 260-327.00R.

Duckworth, Clifford. Method of and apparatus for handling web-like material. 3,900,141, Cl. 226-53.000.

Dudko, Daniil Andreevich: *See*—
Paton, Boris Evgenievich; Gusev, Vladimir Alexeevich; Dudko, Daniil Andreevich; Maximovich, Boleslav Ivanovich; and Asoyants, Grigory Bagradovich, 3,900,149.

Dudley, John S., to Dennison Manufacturing Company. Label printer. 3,899,971, Cl. 101-292.000.

Dudley, Michael Alan: *See*—
Bayles, Francis Derrick; Dudley, Michael Alan; and Metzler, John C., 3,900,701.

Duennenberger, Max: *See*—
Luethi, Christian; Biland, Hans Rudolf; and Duennenberger, Max, 3,900,443.

Duffy, Thomas E.: *See*—
Compton, William A.; Duffy, Thomas E.; and Seegall, Manfred I., 3,899,878.

Duggan, Robert J.: *See*—
Casey, Richard C.; Duggan, Robert J.; Grosky, Stephen A.; Jen, Dixson Teh-Chao; Serra, John J.; Whitehead, Donald Shaffer; and Boyce, Thomas E., 3,900,834.

Dulux Australia Ltd.: *See*—
Lubbock, Frederick John; and Polgar, Livia, 3,900,336.

Dunbar, Joseph E.; and Rogers, Joan H., to Dow Chemical Company, The. Phenylene and xylylene bis(aminecarbotrithioates). 3,900,471, Cl. 260-246.00B.

Dunham, William S.: *See*—
Bock, Joseph J.; and Dunham, William S., 3,900,868.

Dunn, James L., Jr., to Dow Chemical Company, The. Process for treating wood. 3,900,615, Cl. 427-317.000.
Dunston, Frank. Cable ladder fire escape. 3,900,081, Cl. 182-73.000.
du Pont de Nemours, E. I., and Company: *See*—
Alderson, Thomas, 3,900,676.
Deyrup, Alden J., 3,900,689.
Ikeda, Richard Masayoshi; and Michel, Rudolph Henry, 3,900,670.
Jackson, Harold Leonard, 3,900,287.
Marcus, Sanford Morton; and Patterson, Frank Knowles, 3,900,432.
Stinger, Henry Joseph, 3,900,654.
Takeshita, Tsuneichi, 3,900,379.
van Gulick, Norman Martin, 3,900,447.
Woodell, Rudolph, 3,900,631.
Yuan, Edward L., 3,900,662.
Durham, Roger Owen. Chain retention device for elliptical sprockets. 3,899,932, Cl. 74-243.0NC.
Durling, Harold, to Midland-Ross Corporation. Pneumatic brake system incorporating a double check valve. 3,900,230, Cl. 303-84.00A.
Dutton-Lainson Company: *See*—
Brockelsby, Norman D., 3,900,214.
Dvorak, Jim. Bar shear. 3,899,950, Cl. 83-588.000.
Dworski, Michael. Fish lure. 3,899,847, Cl. 43-42.090.
Dynamics Research Corporation: *See*—
Bakewell, Joseph J., 3,900,359.
Dyott, Richard Burnaby; and Stewart, John Hill, to Post Office, The. Coupler for liquid core optical waveguides. 3,900,245, Cl. 350-96.00C.
E. R. A. Patents Limited: *See*—
Bowkley, Ian G.; and Goff, Nigel J., 3,900,773.
E. R. Squibb & Sons, Inc.: *See*—
Krapcho, John, 3,900,478.
Eastman Kodak Company: *See*—
Parsons, William F.; Blair, Gerald E.; and Maier, Clarence C., 3,900,328.
Robertson, Jeffrey C., 3,900,169.
Zannucci, Joseph S.; and Lappin, Gerald R., 3,900,442.
Easton, Walter C. Shank head for drop spindle. 3,899,869, Cl. 57-37.000.
Eaton Corporation: *See*—
Houseman, Henry J.; and Skulley, Gerald W., 3,900,831.
Klein, Richard Edward, 3,899,924.
Ebine, Setsuo: *See*—
Makishima, Hiroshi; Shinohara, Toshio; Kawahara, Yukio; Nii, Hiroshi; and Ebine, Setsuo, 3,900,630.
Eckerstrom, Gunnar Sten Gustav Birger; and Eriksson, Sven Willner, to AB Bofors. Guidance system for an anti-aircraft missile. 3,900,175, Cl. 244-3.130.
Eder, Bernhard: *See*—
Gluck, Maternus; Eder, Bernhard; and Kriegner, Walter, 3,899,850.
Edgewater Corporation: *See*—
Huchette, Paul V.; and Hall, Homer H., Jr., 3,900,357.
Edwards, John Wilmar; and Farrant, Barry William, to Imperial Chemical Industries Limited. Method of forming a fluorocarbon polymer containing coating on a substrate. 3,900,684, Cl. 428-421.000.
Effinger, Cecil S. Paper guide and support for free platen typewriter. 3,900,098, Cl. 197-127.00R.
Eguchi, Osamaru: *See*—
Fukai, Masakazu; Fujiwara, Shinji; Serizawa, Hiroyuki; Eguchi, Osamaru; Kuramoto, Yukimasa; and Chikamura, Takao, 3,900,882.
Ehara, Toshiyasu: *See*—
Takahashi, Toshio; Tagaya, Ryosaku; and Ehara, Toshiyasu, 3,900,266.
Ehrlich, Don E., to TRW Inc. Stud feeder for stud welding tools. 3,900,131, Cl. 221-169.000.
Eibner, Jules A., to Sperry Rand Corporation. Speed tolerant recording and recovery system. 3,900,890, Cl. 360-73.000.
Eisai Co., Ltd.: *See*—
Takahashi, Toshio; Tagaya, Ryosaku; and Ehara, Toshiyasu, 3,900,266.
Ekstedt, Edward E., to General Electric Company. Combustor systems. 3,899,884, Cl. 60-39.74R.
Electricity Council, The: *See*—
Copsey, Mervyn John; and Wilby, Brian Hanson, 3,900,376.
Electronique Marcel Dassault: *See*—
Bouvier, Pierre; and Schumperli, Max, 3,900,873.
Eller, Saul A.: *See*—
Chatten, Clarence K.; Eller, Saul A.; Folb, Reece; and Brisbane, Arthur P., 3,899,991.
Elmgren, Staffan; and Svensson, Lennart, to Allmanna Svenska Elektriska Aktiebolaget. Equipment for treating materials at high temperature and at high pressure. 3,900,189, Cl. 266-5.00E.
Eltra Corporation: *See*—
Seike, Helmut K., 3,900,784.
Emerson Electric Co.: *See*—
Roddy, Joseph T.; and Begley, Russell D., 3,900,234.
Emmel, Ludwig: *See*—
Horlein, Gerhard; Salbeck, Gerhard; and Emmel, Ludwig, 3,900,499.
Emoto, Takeo: *See*—
Era, Akio; and Emoto, Takeo, 3,900,385.
Empisal Knitmaster Luxembourg S.A.: *See*—
Bartels, Manfred, 3,899,899.
Endo, Takaya: *See*—
Fujimatsu, Wataru; Sato, Shui; Kojima, Tamotsu; Endo, Takaya; and Minahara, Kazumi, 3,900,483.
Endres, Dan D.; and Lafond, Esther M., to Kimberly-Clark Corporation. Disposable diaper with reinforced waistband and tape attachment means. 3,900,031, Cl. 128-287.000.
Enei, Hitoshi; Sato, Katsuaki; Anzai, Yasuo; and Okada, Hiroshi, to Ajinomoto Co., Inc. Fermentative production of riboflavine. 3,900,368, Cl. 195-96.000.
Engel, James F.: *See*—
Chappelow, Cecil C., Jr.; and Engel, James F., 3,900,514.
Enns, Kurt; Byerley, John J.; and Beingessner, Clare J. Reduction of toxicity of aqueous solutions. 3,900,377, Cl. 204-149.000.
Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H.: *See*—
Lecomte, Claude, 3,899,990.
Entzmann, Karl: *See*—
Zukriegel, Hans; and Schrom, Eike Karl, 3,900,348.
Environmental Instruments, Inc.: *See*—
Djorup, Robert S., 3,900,819.
Eppich, Alfred: *See*—
Kluge, Karl-Heinz; and Eppich, Alfred, 3,900,643.
Era, Akio; and Emoto, Takeo, to Mitsui Mining & Smelting Co., Ltd. Method for continuous production of electrolytic manganese dioxide. 3,900,385, Cl. 204-96.000.
Eriksson, Sven Willner: *See*—
Eckerstrom, Gunnar Sten Gustav Birger; and Eriksson, Sven Willner, 3,900,175.
Erkens, Andreas: *See*—
Brussard, Hans-Joachim A.; and Erkens, Andreas, 3,899,927.
Ernst Leitz G.m.b.H.: *See*—
Heitmann, Knut; and Schneider, Eckart, 3,900,264.
Escher Wyss GmbH: *See*—
Christ, Alfred; Tognola, Sergio; and Lehmann, Rolf, 3,899,999.
Essmann, Carl J. Writing implement for persons with greatly impaired or lost eyesight. 3,899,839, Cl. 35-38.000.
Ethyl Corporation: *See*—
Lee, Thomas E.; and Laurent, Sebastian M., 3,900,415.
Malec, Robert E., 3,900,410.
Etud S.A.: *See*—
Tanguy, Pierre J., 3,899,961.
Evans, Brian Edward, to Wiggins Teape Research & Development Limited. Capsule-carrying sheets or webs. 3,900,671, Cl. 428-323.000.
Everett, Robert A. Aircraft. 3,900,176, Cl. 244-6.000.
Ewing, Marlin B. Trailer hitch. 3,900,212, Cl. 280-406.00A.
Exxon Nuclear Company, Inc.: *See*—
Gehri, Aime, 3,900,116.
Exxon Research and Engineering Company: *See*—
Lyon, Richard K., 3,900,554.
Riley, Kenneth L.; and Sawyer, Willard H., 3,900,427.
F. Bender Limited: *See*—
Lawrence, John Charles, 3,899,975.
Fabbrica Italiana Magneti Marelli S.p.A.: *See*—
Vignozzi, Pietro; and Cerioli, Paolo, 3,900,013.
Fairchild, James Logan, to Kerr-McGee Chemical Corporation. Automatic control of crystal size distribution. 3,900,292, Cl. 23-273.00R.
Falkenberg, Dieter: *See*—
Rittmayer, Gerhard; Renner, Theodor; Grubmuller, Georg; and Falkenberg, Dieter, 3,900,603.
Faltin, Hans G., to Advance Enterprises, Inc. Auxiliary trim-out unit for printed webs. 3,899,947, Cl. 83-113.000.
Farley, David Elmer: *See*—
Rumpf, Regis Robert; Farley, David Elmer; and Guilbault, Lawrence James, 3,900,338.
Farooq, Saleem: *See*—
Karrer, Friedrich; and Farooq, Saleem, 3,900,507.
Farr, Glyn Phillip Reginald, to Girling Limited. Improvements in hydraulically and mechanically actuatable brake systems with automatic adjusters. 3,900,084, Cl. 188-196.00F.
Farrant, Barry William: *See*—
Edwards, John Wilmar; and Farrant, Barry William, 3,900,684.
Fattore, Vittorio; Moreschini, Paolo; and Notari, Bruno, to Snam Progetti S.p.A. Catalysts for the oxidation of olefines. 3,900,426, Cl. 252-439.000.
Federico, Arthur. Pastry baking apparatus. 3,899,962, Cl. 99-447.000.
Feitzinger, Eduard: *See*—
Bennett, Frank Prescott; and Feitzinger, Eduard, 3,900,862.
Feldstein, Nathan, to RCA Corporation. Method of electroless plating. 3,900,599, Cl. 427-97.000.
Fels, Harlan H.: *See*—
Gee, James E.; and Fels, Harlan H., 3,900,077.
Ferguson, Alan Norman, to Minnesota Mining and Manufacturing Company. Silver halide emulsion containing aromatic azocarbonamide antifog agent. 3,900,321, Cl. 96-76.00R.
Ferma-Gro Corporation: *See*—
Peer, Herbert R., 3,900,572.
Ferranti Limited: *See*—
Tickle, John Edward, 3,900,703.
Ferrari, Giorgio; and Casagrande, Cesare. Ocotea alkaloid for relief of anxiety. 3,900,564, Cl. 424-258.000.
Ferrell, Wesley: *See*—
Neville, James J.; Ferrell, Wesley; and Shichman, Daniel, 3,900,062.
Ferriss, Lincoln S., to Singer Company, The. Gyro pickoff apparatus to sense deviations of a vehicle axis from a gyro spin axis. 3,900,843, Cl. 340-347.0AD.

Ferro Corporation: *See—*
Brueggemann, Walter H.; and Gilhart, Jack S., 3,900,306.

Fetzek, Richard J. Pull out table for attachment beneath an automobile dashboard. 3,899,982, Cl. 108-25.000.

Filipin, Nikolai Andreevich; Alexander, Jury Vladimirovich; Podbubny, Jury Alexandrovich; Mozhzhukhin, Valentin Sergeevich; and Neugodov, Petr Petrovich. Method for washing a vessel in a hermetically closed chamber. 3,900,339, Cl. 134-22.00R.

Filippov, Vyacheslav Ivanovich: *See—*
Somov, Boris Stepanovich; Mamin, Alexandr Ilich; Novikov, Andrei Porfirievich; Filippov, Vyacheslav Ivanovich; Khirdzhiev, Sergei Grigorievich; Gurevich, Vladimir Zakharovich; Voronov, Nikolai Stefanovich; and Agafonov, Ivan Fedorovich, 3,899,908.

Fink, Richard H., to Campbell Chain Company. Coupling link for chain and the like. 3,899,873, Cl. 59-85.000.

Finn Equipment Company, The: *See—*
Keyes, Richard E.; and Justice, Neil, 3,899,984.

Firmenich & Cie: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,900,581.
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,900,582.

Fisher, Donald J., to Xerox Corporation. Non-filming dual additive developer. 3,900,588, Cl. 427-19.000.

Fix, Sidney R., to Goodyear Tire & Rubber Company, The. Cord for extensible belt. 3,900,680, Cl. 428-378.000.

Flament, Ivon: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,900,581.
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,900,582.

Flanigan, Eugene E.; Heintzelman, Quinton L.; and Ricketts, James M., to General Motors Corporation. Gas turbine engine power shift transmission power train. 3,899,877, Cl. 60-39.140.

Fleischer, Wolfgang; and Knuth, Kurt, to Licentia Patent-Verwaltungs-G.m.b.H. Wireless remote operation of an RF receiver. 3,900,880, Cl. 343-228.000.

Florig, Albert J., to Florig Equipment Company, Inc. Hopper closure assembly. 3,899,980, Cl. 105-299.000.

Florig Equipment Company, Inc.: *See—*
Florig, Albert J., 3,899,980.

Flumm, Paul T.; and Harris, Vernon B., to Robertshaw Controls Company. Digital timer and time indicator drums therefor. 3,899,872, Cl. 58-125.00C.

FMC Corporation: *See—*
Koch, Walter T.; and Horsky, Eugene G., 3,900,356.
Nack, Michael R.; and Crawford, Donald C., 3,900,096.

Foin, Owen F., Jr.; and Miley, Frank P., to United States of America, Navy. Electronic counter-countermeasures system for employment against enemy jamming. 3,900,870, Cl. 343-7.00A.

Folb, Reece: *See—*
Chatten, Clarence K.; Eller, Saul A.; Folb, Reece; and Brisbane, Arthur P., 3,899,991.

Foley, Kevin M.: *See—*
Bell, Reuben H.; and Foley, Kevin M., 3,900,506.

Food Research & Equipment Co.: *See—*
Boggs, Weldon C., 3,900,580.

Forbes Jones, Robin Mackay, to International Nickel Company, Inc., The. Castable nickel-chromium stainless steel. 3,900,316, Cl. 75-128.00A.

Ford Motor Company: *See—*
Boerger, David H.; Krugler, Allen D., Jr.; and Willoughby, Donald A., 3,899,897.
Mercer, Nelson M., Jr., 3,899,922.
Muller, George H., 3,900,222.

Fouche, Glynn E., Jr.: *See—*
Stanley, Leonard A.; and Fouche, Glynn E., Jr., 3,899,810.

Fouts, Robert E. Angle adaptor fitting. 3,900,221, Cl. 285-276.000.

Fowler, Oliver W., to Brown & Root, Inc. Method and apparatus for laying pipelines. 3,900,146, Cl. 228-103.000.

Fox Industries: *See—*
Barber, Dennis G., 3,900,677.

Fraiture, Luc F., to Organisation Europeenne de Recherches Spatiales. Attitude measurement system for satellite. 3,899,928, Cl. 73-178.00R.

Francardi, Mario Tullo, to Italcementi S.p.A. Fabbriche Riunite Cemento. Apparatus for determining the point of colour change in volumetric chemical analyses. 3,900,291, Cl. 23-253.00R.

Frank Speno Railroad Ballast Cleaning Company, Inc.: *See—*
Speno, Martin J.; and Bruno, Anthony T., 3,900,392.

Franz, Helmut; and Lecocq, David E., to PPG Industries, Inc. Treatment of thin metallic films for increased durability. 3,900,601, Cl. 427-108.000.

Frasch, Peter U.: *See—*
Beck, Wolfgang; Brunner, Friedrich C.; Frasch, Peter U.; Ivancic, Blanka; Schwerdt, Friedrich W.; and Vogtmann, Theodor, 3,900,337.

Frase, Roland J.: *See—*
Johnson, Otto E.; Frase, Roland J.; and Treptow, Ernest G., 3,900,201.

Fraser, Lawrence J.; and Parker, Delmer G., to Xerox Corporation. Developing apparatus. 3,900,001, Cl. 118-637.000.

Fraze, Ermal C.: *See—*
Brown, Omar L., 3,900,128.

Frechtling, Hank. Toolpost structure. 3,899,944, Cl. 82-36.000.

Freck, James A.; O'Rell, Dale H.; and Kondrot, Leonard V., to American Maize Products Company. Process for making retort stable simulated meat products. 3,900,573, Cl. 426-274.000.

Fred Storm Industrial Designs, Inc.: *See—*
Storm, Fred K.; and Smiley, Eldridge H., 3,899,829.

Freese, Robert W.; Lekebusch, Ronald C.; and Ulcickas, Paul W., to GTE Sylvania Incorporated. High intensity metal arc discharge lamp. 3,900,761, Cl. 315-60.000.

Frey, J. Richard: *See—*
Barclay, Francis W.; Frey, J. Richard; Wilson, James N.; and Besant, Robert W., 3,900,365.

Frick, Hughie R.: *See—*
Anderson, Richard W.; and Frick, Hughie R., 3,900,380.

Friedemann, Wolfgang: *See—*
Germscheid, Hans Gunther; Friedemann, Wolfgang; and Geisler, Roland, 3,900,370.

Friedman, Seymour Jack, to O.M.I. Corporation of America. Apparatus and method for optical annotation of orthophotographs. 3,900,859, Cl. 354-109.000.

Friedsam, Josef: *See—*
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Platz, Stephan; Friedsam, Josef; Schweicher, Wolfgang; Behr, Rolf; Wasser, Willi; and Browatzki, Kurt, 3,900,326.

Friestad, Isak Andreas, to Norsk Hydro A.S. Means for feeding fluid materials to a prilling bucket. 3,900,164, Cl. 239-222.000.

Fritsch, Werner: *See—*
Radscheit, Kurt; Stache, Ulrich; Fritsch, Werner; and Haede, Werner, 3,900,502.

Froberg, Robert W.: *See—*
Robba, William A.; and Froberg, Robert W., 3,900,540.

Froumajou, Armand, to Automobiles Peugeot; and Regie Nationale des Usines Renault. Control device for a gearbox of a vehicle. 3,899,934, Cl. 74-471.0XY.

Fry, William Lawrence, to Rist's Wires & Cables Limited. Wiring harness. 3,900,241, Cl. 339-59.00M.

Fuchs, Hermann; and Meininger, Fritz, to Hoechst Aktiengesellschaft. Sulfuric acid ester of 1-aminobenzene-4-(β-hydroxyethyl-sulfone)-2-sulfonic acid, the 4-vinylsulfone compound thereof and a process for their preparation. 3,900,510, Cl. 260-458.000.

Fuchser, Fritz: *See—*
Rottermann, Robert; and Fuchser, Fritz, 3,900,108.

Fuji Photo Film Co., Ltd.: *See—*
Hayashi, Takao; and Matsukawa, Hiroharu, 3,900,216.
Hayashi, Takao; Matsukawa, Hiroharu; and Ishige, Sadao, 3,900,217.
Kato, Hajime; and Hayashi, Takao, 3,900,215.
Kiritani, Masataka, 3,900,669.
Miyamoto, Akio; and Matsukawa, Hiroharu, 3,900,218.
Oishi, Yasushi; Hayashi, Jun; and Yoshida, Yoshinobu, 3,900,322.
Tada, Sugihiko; Nishigaki, Yasuo; and Sugiyama, Masatoshi, 3,900,523.

Fujii, Tuneo; and Nakamura, Yukiharu, to Daikin Kogyo Co., Ltd. Polyfluorocarbon article and method for making the same. 3,900,658, Cl. 428-220.000.

Fujimatsu, Wataru; Sato, Shui; Kojima, Tamotsu; Endo, Takaya; and Minahara, Kazumi, to Konishiroku Photo Industry Co., Ltd. γ-[2(1-H)pyridone]γ-pivalyl-5-(γ-2,4-di-t-amyl-phenoxybutyramide)-acetanilides and derivatives. 3,900,483, Cl. 260-294.900.

Fujisawa, Kazuo, to Osaka University. Device for observing waveform repeated at high frequency. 3,900,759, Cl. 315-10.000.

Fujitsu Ltd.: *See—*
Andoh, Shizuo; and Nakayama, Norihiko, 3,900,758.
Hamada, Michihiro; Maeda, Youji; and Inoue, Shinichi, 3,900,807.
Tsukada, Kazuo; Sunagawa, Mitsuru; and Kanzaki, Yoshiharu, 3,900,876.

Fujiwara, Shinji: *See—*
Fukai, Masakazu; Fujiwara, Shinji; Serizawa, Hiroyuki; Eguchi, Osamaru; Kuramoto, Yukimasa; and Chikamura, Takao, 3,900,882.

Fukai, Masakazu; Fujiwara, Shinji; Serizawa, Hiroyuki; Eguchi, Osamaru; Kuramoto, Yukimasa; and Chikamura, Takao, to Matsushita Electric Industrial Co., Ltd. Photoconductor element. 3,900,882, Cl. 357-30.000.

Fukao, Satoshi, to Brother Kogyo Kabushiki Kaisha. Keyboard switch arrangement. 3,900,712, Cl. 200-307.000.

Fukuma, Noboru: *See—*
Aishima, Itsuho; Fukuma, Noboru; Sakura, Hisaya; Chayamiti, Hiroshi; Okamoto, Toshio; Doi, Yuzuru; and Henmi, Hiroshi, 3,900,678.

Fukunaga, Yoshiaki: *See—*
Morimoto, Toshio; and Fukunaga, Yoshiaki, 3,900,174.

Fuller, Ronald George. Marine steering device. 3,899,992, Cl. 115-42.000.

Funderburk, James O., Jr.; and Vicik, Stephen J., to Union Carbide Corporation. Multilayer shrinkable film for poultry bags. 3,900,635, Cl. 428-213.000.

Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; by Vogler, Franziska, heir; by Vogler, Niklaus E., heir; and by Vogler, Heinrich, heir, to Hoffmann-La Roche Inc. 6-Acyl derivatives of aminopenicillanic acid. 3,900,464, Cl. 260-239.100.

Furuno, Hiroshi, to Sony Corporation. Gain controlled differential amplifier. 3,900,801, Cl. 330-29.000.

Fusey, Pierre, to Societe Anonyme: Banque pour l'Expansion Industrielle "Banexi". Method of accelerating the biodegradation of petroleum products. 3,900,421, Cl. 252-312.000.

G. D. Societa in Accomandita Semplice di Enzo Seragnoli e Ariosto Seragnoli: *See*—
Seragnoli, Ariosto, deceased; and Romano, Elazar, legal representative, 3,899,863.

Gadsby, William, to Kanrich, Nathaniel G. Peaked roof structure of polyurethane molded building panels with integral, bonded, low-density urethane insulation backing. 3,899,855, Cl. 52-90.000.

GAF Corporation: *See*—
Barabas, Eugene S.; and Smolin, Edwin M., 3,900,663.
Bennett, Frank Prescott; and Feitzinger, Eduard, 3,900,862.
Chang, Charles H., 3,900,472.

Gallen, Thomas J. Apparatus for spray coating articles. 3,900,000, Cl. 118-630.000.

Gallman, Otice. Decorative stud setting tool. 3,900,143, Cl. 227-109.000.

Galmiche, Philippe Marie; and Hivert, Andre, to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.). Production of surface diffusion alloys. 3,900,613, Cl. 427-237.000.

Galperin, Alexandr Lvovich: *See*—
Zabotin, Alexandr Alexandrovich; Onikov, Eduard Arshakovich; Galperin, Alexandr Lvovich; Loschilin, Evgeny Dmitrievich; Lileev, Valerian Petrovich; German, Roman Anatolievich; Rutkevich, Zinovy Yakovlevich; and Sakharov, Boris Alexandrovich, 3,900,049.

Gangal, Mukund D.: *See*—
Banerjee, Bani R.; Gangal, Mukund D.; and Black, Sigmund, 3,899,893.

Garrett, Clyde Barner; and Thayer, William Stansbury, to Koppers Company, Inc. Method and apparatus for accurate die-cutting. 3,899,945, Cl. 83-38.000.

Garrison, Harold Keith: *See*—
White, Allen A.; Garrison, Harold Keith; and Brooks, Dean P., 3,899,966.

Gaston County Dyeing Machine Co.: *See*—
Clifford, Graham F.; and Spurrier, Mack W., 3,899,817.

Gaudet, Fernand W., to Canadian Marconi Company. Protective enclosure. 3,900,700, Cl. 174-16.00R.

Gautschi, Fritz: *See*—
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,900,581.
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Gay, Walter A.; and Tobin, John H., to Olin Corporation. Process for preparing para-fluoroanilines. 3,900,519, Cl. 260-580.000.

Gaylord, Norman G., to Champion International Corporation. Cellulose-polymer composites. 3,900,685, Cl. 428-420.000.

Gebruder Knauf Westdeutsche Gipswerke: *See*—
Knauf, Karl, 3,900,333.

Gee, James E.; and Fels, Harlan H., to Caterpillar Tractor Company. Vehicle for surf zone work. 3,900,077, Cl. 180-9.460.

Gehri, Aime, to Exxon Nuclear Company, Inc. Fuel element shipping shim for nuclear reactor. 3,900,116, Cl. 214-10.50R.

Geisler, Robert L.; Koury, James L.; and Johnston, Arch D., to United States of America, Air Force. Acoustic emission system for solid propellant burn rate measurements. 3,899,919, Cl. 73-35.000.

Geisler, Roland: *See*—
Germscheid, Hans Gunther; Friedemann, Wolfgang; and Geisler, Roland, 3,900,370.

Gendron, Wilfred H., to United States Envelope Company. Continuous form envelopes. 3,900,159, Cl. 229-69.000.

General Dynamics Corporation: *See*—
Mimken, Frederick J., 3,900,797.

General Electric Company: *See*—
Brown, John F., Jr., 3,900,382.
Cooper, Glenn D.; and Bennett, James G., 3,900,445.
Ekstedt, Edward E., 3,899,884.
Grenoble, Maurice E., 3,900,617.
Herzog, Rollie R.; and Alley, Robert P., 3,900,783.
Johnston, Richard Paul; and Levins, Dave Baer, 3,900,274.
Powers, Robert W., 3,900,381.
Schaefer, Donald L., 3,900,865.
Turner, Charlie B., 3,900,763.
Walters, Robert Bruce, 3,900,681.

General Foods Corporation: *See*—
Haas, Gerhard J., 3,900,577.

General Mills Chemicals, Inc.: *See*—
Preston, Harold M., 3,900,437.

General Motors Corporation: *See*—
Arvin, John R.; Sullivan, Robert E.; Troth, Dennis L.; and Verdouw, Albert J., 3,899,881.
Downing, Noel L., 3,899,879.
Flanigan, Eugene E.; Heintzelman, Quinton L.; and Ricketts, James M., 3,899,877.
Russo, Andrew, Jr., 3,900,769.
Swick, Robert M., 3,899,886.

General Tire & Rubber Company, The: *See*—
Milgrom, Jack, 3,900,518.

Gentet, Pierre: *See*—
Alric, Andre; Carlet, Xavier; Nozeran, Robert; and Gentet, Pierre, 3,900,785.

Gentron Corporation: *See*—
Kaufman, Lance R., 3,900,770.

Georg Fischer Aktiengesellschaft: *See*—
Hofer, Peter, 3,899,825.

Geppert, Albrecht: *See*—
Beerwerth, Wolfgang; Geppert, Albrecht; and Schimmer, Rigobert, 3,900,153.

Gerlach, C. Richard: *See*—
Parke, James G.; and Gerlach, C. Richard, 3,900,165.

German, Roman Anatolievich: *See*—
Zabotin, Alexandr Alexandrovich; Onikov, Eduard Arshakovich; Galperin, Alexandr Lvovich; Loschilin, Evgeny Dmitrievich; Lileev, Valerian Petrovich; German, Roman Anatolievich; Rutkevich, Zinovy Yakovlevich; and Sakharov, Boris Alexandrovich, 3,900,049.

Germscheid, Hans Gunther; Friedemann, Wolfgang; and Geisler, Roland, to Henkel & Cie G.m.b.H. Process for treating aluminum surfaces. 3,900,370, Cl. 204-38.00A.

Gesellschaft fur Kernforschung m.b.H.: *See*—
Class, Gottfried, 3,900,367.

GF Business Equipment, Inc.: *See*—
Goulish, Gabriel J.; Terlecki, Leo; and Wright, Alan R., 3,900,236.

Giardini, Virgil Victor; and Bisker, Richard Gordon, to Dresser Industries, Inc. Vapor recovery nozzle. 3,900,056, Cl. 141-93.000.

Gibbon, John; Heacock, Burt; Lipnick, Richard; Strenkowski, John; and Tutino, Matthew, to Lockheed Electronics Co., Inc. Computer automated radar terminal system. 3,900,846, Cl. 343-6.00R.

Gibson, David K., to International Business Machines Corporation. Sheet feeding apparatus. 3,900,192, Cl. 271-3.100.

Gilhart, Jack S.: *See*—
Brueggemann, Walter H.; and Gilhart, Jack S., 3,900,306.

Gillette Company, The: *See*—
Curry, Francis Russell; and Clipstone, Colin John, 3,900,636.

Gillette, Deighton D., to Iowa State University Research Foundation, Inc. System for exchanging blood ultrafiltrate. 3,900,398, Cl. 210-196.000.

Gilman, William S.; Jones, John L.; and Rubino, Andrew M., to Armour Pharmaceuticals Company. Basic aluminum systems useful as wood-stain reducing agents. 3,900,620, Cl. 427-408.000.

Ginger, Roger D.; and Samour, Carlos M., to Kendall Company, The. Trifluoroalkyl, fluorobenzyl, pentafluorobenzyl, fluorobenzenesulfonyl, and pentafluorobenzenesulfonyl theophyllines. 3,900,474, Cl. 260-256.000.

Giori, Gualtiero, to De la Rue Giori S.A. Method of making wiping cylinder of steel engraving printing press. 3,900,595, Cl. 427-55.000.

Girdner, William I.; and Miller, John H., III, to Hewlett-Packard Company. Magnetic read-record head with housing locator structure. 3,900,895, Cl. 360-121.000.

Girling Limited: *See*—
Farr, Glyn Phillip Reginald, 3,900,084.
Harrison, Anthony William, 3,900,085.
Hiscox, Leonard Ramsey, 3,900,228.

Girman, Stephen J., to Lehigh Press, Inc., The. Pop-up carton construction. 3,900,100, Cl. 206-45.130.

Gith, Walter. Device for photoelectrically monitoring dynamic processes. 3,900,730, Cl. 250-206.000.

Giunta, Joseph S.; and Lazzaretti, Louis G., to United States Steel Corporation. Flux feeding method and apparatus. 3,900,065, Cl. 164-273.00R.

Givaudan Corporation: *See*—
Dubs, Paul; Kuntzel, Heiner; and Pesaro, Mario, 3,900,498.
Schenk, Hanspeter; and Sigg-Grutter, Trudi, 3,900,520.

GKN Sankey Limited: *See*—
Hart, Frederick Leslie; and Sharp, Herbert John, 3,900,649.

Glasgow, David G.: *See*—
McClung, Charles E.; and Glasgow, David G., 3,900,446.

Glasurit Werke M. Winkelmann GmbH: *See*—
Schwarz, Gunther, 3,900,690.

Glaverbel-Mecaniver S.A.: *See*—
Plumat, Emile; and Demoulin, Pierre, 3,900,634.

Glaxo Laboratories Limited: *See*—
Davis, Benjamin; and Pearce, Derek Roger, 3,900,561.
Underwood, William George Elphinstone; and Long, Alan Gibson, 3,900,487.

Glazebrook, Gerald L., to National Building Industries. Marine panel hanging assembly. 3,899,989, Cl. 114-84.000.

Glenn, William E., Jr.; and Rutherford, Robert E., Jr., to CBS Inc. Electron beam tube having post deflection lens. 3,900,760, Cl. 315-17.000.

Gluck, Maternus; Eder, Bernhard; and Kriegner, Walter, to Semperit AG. Carrier bodies for plants. 3,899,850, Cl. 47-37.000.

Godsey, Frank W., Jr., to Buryan Associates. Magnetic suspension systems for vehicles. 3,899,979. Cl. 104-148.0MS.

Goff, Nigel J.: *See*—
Bowkley, Ian G.; and Goff, Nigel J., 3,900,773.

Gogarty, William B.: *See*—
Merrill, La Vaun S., Jr.; Drayer, Dennis E.; Gogarty, William B.; and Pouska, George A., 3,900,391.

Goldammer, Georg: *See*—
Bystron, Bruno; Hoeber, W. Gerhard; and Goldammer, Georg, 3,899,949.

Goldman, Irving M.: *See*—
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,900,581.
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,900,582.

Goldman, Jerome N.: *See*—
Goldman, Marvin A.; and Goldman, Jerome N., 3,900,004.

Goldman, Marvin A.; and Goldman, Jerome N., to Penn-Plax Plastics, Inc. Automatic circulating hatchery. 3,900,004, Cl. 119-3.000.

Goldsmith, Frank Edward, to Alfa-Laval AB. Milking machine. 3,900,005, Cl. 119-14.410.

Goodman, David Samuel: *See*—
Anhalt, John William; and Goodman, David Samuel, 3,900,239.

Goodsite, James R., to Westvaco Corporation. Bathtub package. 3,900,101, Cl. 206-320.000.

Goodyear Tire & Rubber Company, The: *See*—
Curtiss, Walter W., Jr., 3,900,061.
Fix, Sidney R., 3,900,680.
Herman, Eugene T.; and McIntosh, Kenneth W., 3,900,280.

Gordesky, Stanley E.: *See*—
Sim, James S. Y.; Van Horn, Maurice H.; Cohen, Arthur I.; Gordesky, Stanley E.; and Gordon, Stanley I., 3,900,559.

Gordon, Stanley I.: *See*—
Sim, James S. Y.; Van Horn, Maurice H.; Cohen, Arthur I.; Gordesky, Stanley E.; and Gordon, Stanley I., 3,900,559.

Gotaverken Angteknik AB: *See*—
Stenlund, Hans, 3,900,011.

Goto, Hideyuki; Morishita, Shoji; and Usami, Takashi. Paper currency dispensing envelope. 3,900,160, Cl. 229-71.000.

Goto, Toshiho; and Nishino, Yoshinori, to Hitachi Shipbuilding and Engineering Co. Ltd. Method of internally winding reinforcing material and of producing reinforced synthetic pipe. 3,900,355, Cl. 156-74.000.

Goulish, Gabriel J.; Terlecki, Leo; and Wright, Alan R., to GF Business Equipment, Inc. File interlock. 3,900,236, Cl. 312-217.000.

Graber, Andreas; and Horr, Claus, to Niro-Plan AG Oftringen. Machine for cleaning containers. 3,900,040, Cl. 134-127.000.

Grant, Charles P., Jr.: *See*—
Cochran, Michael J.; and Grant, Charles P., Jr., 3,900,722.

Grant, Frederic F.: *See*—
Westover, Dwight G.; and Grant, Frederic F., 3,900,191.

Grant, Leon E.: *See*—
Oliver, Haven D.; Burke, Richard K.; Dobson, Herbert, Jr.; and Grant, Leon E., 3,900,401.

Gravel, Charles L.: *See*—
Kurtz, Anthony D.; Brosh, Amnon; Gravel, Charles L.; and Mallon, Joseph R., 3,900,811.

Greaser, Sheridan H.; and Russell, Edwin T., to Union Carbide Corporation. Galvanic cell structures employing coiled electrodes. 3,900,340, Cl. 136-13.000.

Great Canadian Oil Sands Limited: *See*—
Baillie, Robert A., 3,900,389.

Greco, Nicholas P., to Koppers Company, Inc. Production of catechol. 3,900,522, Cl. 260-621.00H.

Green, Raymond G.: *See*—
Ulman, Lynn J.; and Green, Raymond G., 3,900,850.

Greening, Donald J., deceased: *See*—
Smith, Charles E.; Hink, Karl M.; Greening, Donald J., deceased; and Greening, Dorothy, executrix, 3,900,781.

Greening, Dorothy, executrix: *See*—
Smith, Charles E.; Hink, Karl M.; Greening, Donald J., deceased; and Greening, Dorothy, executrix, 3,900,781.

Gref, Hans: *See*—
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Platz, Stephan; Friedsam, Josef; Schweicher, Wolfgang; Behr, Rolf; Wasser, Willi; and Browatzki, Kurt, 3,900,326.

Grenier, Aime J., to Texas Instruments Incorporated. Time delay capsule for magnetic circuit breaker. 3,900,810, Cl. 335-239.000.

Grenoble, Maurice E., to General Electric Company. Method of rendering flexible sheet material non-adherent and article produced thereby. 3,900,617, Cl. 427-387.000.

Griebsch, Eugen: *See*—
Drawert, Manfred; Griebsch, Eugen; Krieger, Bernhard; Schepp, Horst; and Burba, Christian, 3,900,436.

Griffith, Glen R.; and Deutsch, Ralph, to Nippon Gakki Seizo Kabushiki Kaisha. Key switch scanning and encoding system. 3,899,951, Cl. 84-1.010.

Griffith, Huw Bevan: *See*—
Makepeace, Anthony Peter Walter; and Griffith, Huw Bevan, 3,900,021.

Griffiths, Donald E.; Kalthoff, Clement H.; and Laenen, Edward G., to International Business Machines Corporation. Rotating-head mandrel with cam surface. 3,900,891, Cl. 360-84.000.

Griffolyn Company, Inc.: *See*—
Chen, Wei-Gwo, 3,900,625.

Griser, Johann Martin; and Blohm, Thomas R., to Richardson-Merrell Inc. Hypoglycemic compositions containing benzhydryllactamimide derivatives. 3,900,565, Cl. 424-274.000.

Grosky, Stephen A.: *See*—
Casey, Richard C.; Duggan, Robert J.; Grosky, Stephen A.; Jen, Dixson Teh-Chao; Serra, John J.; Whitehead, Donald Shaffer; and Boyce, Thomas E., 3,900,834.

Gross, John H.: *See*—
Chao, Hung-Chi; Gross, John H.; Judd, Robert R.; and Rueckl, Roger L., 3,900,309.

Grossi, Giuseppe: *See*—
Bardoncelli, Franco; and Grossi, Giuseppe, 3,900,551.

Grubb, Everett F.; Hagedorn, Erwin C.; and Monks, Joseph R., to Owens-Illinois, Inc. Glass compositions. 3,900,329, Cl. 106-52.000.

Gruber, Rudolf: *See*—
Konersmann, Erhard; and Gruber, Rudolf, 3,900,720.

Grubmuller, Georg: *See*—
Rittmayer, Gerhard; Renner, Theodor; Grubmuller, Georg; and Falkenberg, Dieter, 3,900,603.

Gruppo Lepetit, S.p.A.: *See*—
Bellasio, Elvio; and Cristiani, Franco, 3,900,515.
Cricchio, Renato; and Lancini, Giancarlo, 3,900,465.
Lancini, Giancarlo; Lazzari, Ettore; and Diena, Alberto, 3,900,567.

Gschwend, Norbert: *See*—
Bahler, Andre; Gschwend, Norbert; and Scheier, Heinrich, 3,899,796.

GTE Sylvania Incorporated: *See*—
Bamberg, William I.; and Keeffe, William M., 3,900,750.
Freese, Robert W.; Lekebusch, Ronald C.; and Ulcickas, Paul W., 3,900,761.
Marcucci, Rudoph, 3,900,237.
Richardson, Donald A., 3,900,753.

Gude, Armin: *See*—
Muller, Karl-Adolf; Gude, Armin; and Menzel, Gerhard, 3,900,607.

Guilbault, Lawrence James: *See*—
Rumpf, Regis Robert; Farley, David Elmer; and Guilbault, Lawrence James, 3,900,338.

Gulf & Western Manufacturing Company: *See*—
Burtch, Kurt A.; and Lewis, James A., 3,900,142.

Gunby, Leslie, to PPG Industries, Inc. Method of assembling a bipolar electrode having friction welded conductor/connector means and bipolar electrode formed thereby. 3,900,384, Cl. 204-286.000.

Gunst, Dennis, to Schwartzman, Morris, a part interest. Inflatable structural component. 3,899,797, Cl. 5-350.000.

Gupta, Prem Chandra: *See*—
Calder, Peter Henry; Gupta, Prem Chandra; and Lewis, William James, 3,900,177.

Gurevich, Vladimir Zakharovich: *See*—
Somov, Boris Stepanovich; Mamin, Alexandr Ilich; Novikov, Andrei Porfirievich; Filippov, Vyacheslav Ivanovich; Khirdzhiev, Sergei Grigorievich; Gurevich, Vladimir Zakharovich; Voronov, Nikolai Stefanovich; and Agafonov, Ivan Fedorovich, 3,899,908.

Gusev, Vladimir Alexeevich: *See*—
Paton, Boris Evgenievich; Gusev, Vladimir Alexeevich; Dudko, Daniil Andreevich; Maximovich, Boleslav Ivanovich; and Asoyants, Grigory Bagradovich, 3,900,149.

Guthrie, James L.; and Rendulic, Francis J., to W. R. Grace & Co. Photocurable triazine containing polyene-polythiol lacquer composition. 3,900,594, Cl. 427-53.000.

Gutschik, Ernst: *See*—
Hoppe, Peter; Drouven, Gustav; Wandel, Martin; Gutschik, Ernst; and Brokmeier, Dieter, 3,900,651.

Haak, Willard J.: *See*—
Carlson, Guy C., Jr.; and Haak, Willard J., 3,899,957.

Haas, Friedrich: *See*—
Dietrich, Manfred; Schnetger, Jochen; Haas, Friedrich; Marwede, Gunter; and Appel, Hansgunter, 3,900,532.

Haas, Gerhard J., to General Foods Corporation. Method for preparing expanded dry gels. 3,900,577, Cl. 426-312.000.

Haberkern, Klaus, to Zellweger, Ltd. Yarn clamping device. 3,899,809, Cl. 28-64.000.

Habermeier, Jurgen; Batzer, Hans; and Porret, Daniel, to Ciba-Geigy Corporation. Polyglycidyl compounds containing N-heterocyclic structure. 3,900,493, Cl. 260-309.500.

Haden, Elard L., to Continental Oil Company. Method and apparatus for continual compilation of a well data log. 3,899,926, Cl. 73-153.000.

Haede, Werner: *See*—
Radscheit, Kurt; Stache, Ulrich; Fritsch, Werner; and Haede, Werner, 3,900,502.

Hagedorn, Erwin C.: *See*—
Grubb, Everett F.; Hagedorn, Erwin C.; and Monks, Joseph R., 3,900,329.

Hagerty, John P., to Hagerty Research and Development Co., Inc. Electro-magnetic energizer. 3,899,885, Cl. 60-203.000.

Hagerty Research and Development Co., Inc.: *See*—
Hagerty, John P., 3,899,885.

Haggerty, William Andrew, to Cincinnati Milacron, Inc. Method of electrochemical machining. 3,900,374, Cl. 204-129.500.

Hague, John M., III: *See*—
Wright, Dexter V.; and Hague, John M., III, 3,899,933.

Hainy, Siegfried: *See*—
Aust, Gert-Rudiger; Hainy, Siegfried; and Korf, Erich, 3,900,861.

Hajduk, Thaddeus J.: *See*—
Cook, Charles A.; and Hajduk, Thaddeus J., 3,899,994.

Hall, Edward L.; and Philofsky, Elliott M., to Motorola, Inc. Ohmic contacts and method of producing same. 3,900,598, Cl. 427-90.000.

Hall, Homer H., Jr.: *See*—
Huchette, Paul V.; and Hall, Homer H., Jr., 3,900,357.

Hall, Joseph F., Jr. Method for minimizing deviation in optical dispersion systems. 3,900,263, Cl. 356-74.000.

Hall, Ronald D.: *See*—
Marriott, Carroll L.; Patzer, Hans E.; Hall, Ronald D.; Caposell, Charles D.; and Klein, Aaron David, 3,900,353.

Halliburton Company: *See*—
Chatterji, Jiten; Holtmyer, Marlin D.; and Tiner, Robert L., 3,900,070.

Hamada, Michihiro; Maeda, Youji; and Inoue, Shinichi, to Fujitsu Ltd. Magnetically controlled switching device. 3,900,807, Cl. 335-152.000.

Hamalainen, Carl: *See*—
St. Mard, Hubert H.; Cooper, Albert S., Jr.; and Hamalainen, Carl, 3,900,666.

Hamamatsu TV Co., Ltd.: *See*—
Soga, Hiromu; Minamida, Katsuhiro; Kurasawa, Kazuo; and Ii, Masatake, 3,900,887.

Hambro Forest Products, Inc.: *See*—
Hamilton, Haldon L., 3,900,144.

Hamer, Brian; and Doman, David G., to Kitchens of Sara Lee (Canada) Ltd. Automatic icing machine for cakes. 3,900,054, Cl. 141-1.000.

Hamilton, Arthur C., to Texcone Limited. Textile cone. 3,900,168, Cl. 242-118.320.

Hamilton, Haldon L., to Hambro Forest Products, Inc. Fastening machine. 3,900,144, Cl. 227-155.000.

Hamilton, Ramon D.; and Schneider, William P., to Upjohn Company, The. Extract containing prostaglandins. 3,900,513, Cl. 260-468.00D.

Hammerschmitt, Peter, to BASF Aktiengesellschaft'. System for compensating for temperature variations in a magnetic disc drive. 3,900,782, Cl. 318-634.000.

Hammond, Vivan Joseph; Norgate, Peter; Onoki, Fumio; Kamiya, Hajime; and Ohno, Kazuaki, to Hoya Lens Co., Ltd. Process for coating an optical material and the resulting product. 3,900,672, Cl. 428-334.000.

Hampel, Daniel; Prost, Kalman J.; and Scheinberg, Norman R., to United States of America, Navy. Threshold logic using complementary mos device. 3,900,742, Cl. 307-211.000.

Hanas, Bertil: *See*—
Andersson, Conny; Hanas, Bertil; Korsell, Torsten; and Nilsson, Jan, 3,900,695.

Hanchett, Leland J., to Taplin Business Machines Incorporated. Bar code processing and detecting system. 3,900,832, Cl. 340-146.30Z.

Hanna, Daniel C. Pit mounted brush assembly. 3,899,799, Cl. 15-21.00D.

Hanson, Brian A., to Hear-Muffs, Inc. Speaker apparatus. 3,900,707, Cl. 179-156.00R.

Harbison, William H.: *See*—
Wittwer, Robert O.; and Harbison, William H., 3,899,800.

Harding, Richard John Arthur; and Moss, Colin Roy, to Hawker Siddeley Dynamics Ltd. Cell cooling. 3,899,976, Cl. 102-70.20R.

Hardwick, David R.; and Coors, George T., to Ledex, Inc. Proportional solenoid. 3,900,822, Cl. 335-268.000.

Harkki, Seppo Untamo: *See*—
Kaasila, Kauko Johannes; Toivanen, Toivo Adrian; Harkki, Seppo Untamo; Neimela, Toivo Isak; Makipirtti, Simo A.; Malmstrom, Rolf E.; Tuominen, Tapio Kalevi; Aaltonen, Olavi August; and Noponen, Veikko H., 3,900,310.

Harnau, Hans-Dieter, to Rheinmetall GmbH. Electric propulsive charge igniter. 3,899,974, Cl. 102-46.000.

Harned, Frederick G., to Continental Can Company, Inc. Trapezoidal container having end-flaps that wedgingly entrap a tray. 3,900,104, Cl. 206-491.000.

Harnett, Rodney David. Educational apparatus. 3,899,837, Cl. 35-8.00B.

Harnish, Daniel F.: *See*—
Taub, Bernard; and Harnish, Daniel F., 3,900,433.

Harris, Harry Gordon, Jr.: *See*—
Terry, John Christopher; Lippman, Alfred; Sebenik, Roger Frank; and Harris, Harry Gordon, Jr., 3,900,312.

Harris, Vernon B.: *See*—
Flumm, Paul T.; and Harris, Vernon B., 3,899,872.

Harrison, Anthony William, to Girling Limited. Improvement relating to brake adjusters. 3,900,085, Cl. 188-196.00D.

Harrison, Earnest R., Jr., to Westinghouse Electric Corporation. Electronic compass system. 3,899,834, Cl. 33-352.000.

Harrison, Ronnie M.: *See*—
Tallent, Michael W.; Hendershot, William B.; Swain, Allan L.; and Harrison, Ronnie M., 3,900,885.

Hart, Donald R.: *See*—
Northup, Francis B.; and Hart, Donald R., 3,899,867.

Hart, Frederick Leslie; and Sharp, Herbert John, to GKN Sankey Limited; and Aro Plastics Development Limited. Moulded articles. 3,900,649, Cl. 428-76.000.

Hartzler, Harold Eugene: *See*—
Buckler, Robert Thomas; Hartzler, Harold Eugene; Hayao, Shin; and Nichols, Gust, 3,900,492.

Harvey, Leslie Augustus: *See*—
Ward, Frederick Alfonso; and Harvey, Leslie Augustus, 3,900,194.

Hasegawa, Nobuo; Yamashita, Toshio; and Kitamura, Saburo, to Matsushita Electric Industrial Co., Ltd. Photoconductive cell matrix assembly. 3,900,883, Cl. 357-32.000.

Hatada, Kenji: *See*—
Kawakami, Ken-Ichi; Hatada, Kenji; and Yamaguchi, Yasuhiko, 3,900,538.

Hatsukano, Yoshikazu: *See*—
Tsuiki, Takao; and Hatsukano, Yoshikazu, 3,900,845.

Hatt, Thomas L., to Akzona Incorporated. Carpets and rugs. 3,900,623, Cl. 428-92.000.

Hattori, Osamu: *See*—
Takami, Norihiko; Hattori, Osamu; and Wakabayashi, Manabu, 3,899,827.

Haubner, Georg; Hofer, Walter; and Schmaldienst, Peter, to Robert Bosch G.m.b.H. Capacitor discharge ignition system for an internal combustion engine. 3,900,016, Cl. 123-148.0CC.

Haug, Theobald: *See*—
Rembold, Heinz; Haug, Theobald; Wyler, Sigfried; and Kiefer, Jurg, 3,900,449.

Hausfeld, Brian A., to United States of America, Air Force. Valve system for confined vortex flow system. 3,899,925, Cl. 73-147.000.

Hauth, Jean-Marc Laurent, to Pont-a-Mousson A.G. Self-releasing brake device. 3,900,083, Cl. 188-72.200.

Hawker Siddeley Dynamics Ltd.: *See*—
Harding, Richard John Arthur; and Moss, Colin Roy, 3,899,976.

Hayao, Shin: *See*—
Buckler, Robert Thomas; Hartzler, Harold Eugene; Hayao, Shin; and Nichols, Gust, 3,900,492.

Hayashi, Jun: *See*—
Oishi, Yasushi; Hayashi, Jun; and Yoshida, Yoshinobu, 3,900,322.

Hayashi, Takao; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Method for producing clay coated paper for pressure sensitive copying paper. 3,900,216, Cl. 282-27.500.

Hayashi, Takao; Matsukawa, Hiroharu; and Ishige, Sadao, to Fuji Photo Film Co., Ltd. Pressure-sensitive copying paper. 3,900,217, Cl. 282-27.500.

Hayashi, Takao: *See*—
Kato, Hajime; and Hayashi, Takao, 3,900,215.

Hayes, John C., to Universal Oil Products Company. Hydroprocessing of hydrocarbons. 3,900,386, Cl. 208-111.000.

Haynes, James N., to Hercules Incorporated. Azidoformates and their use. 3,900,683, Cl. 428-409.000.

Heacock, Burt: *See*—
Gibbon, John; Heacock, Burt; Lipnick, Richard; Strenkowski, John; and Tutino, Matthew, 3,900,846.

Hear-Muffs, Inc.: *See*—
Hanson, Brian A., 3,900,707.

Heikkila, Risto Markus: *See*—
Tuovinen, Frans Heikki; Blomquist, Seppo Ilmari; Heikkila, Risto Markus; Honkasalo, Jorma Bruno; and Kunttu, Kalevi Johan, 3,900,117.

Heinemeyer, Ben W.: *See*—
Oliver, Bruce L.; and Heinemeyer, Ben W., 3,900,550.

Heintzelman, Quinton L.: *See*—
Flanigan, Eugene E.; Heintzelman, Quinton L.; and Ricketts, James M., 3,899,877.

Heitmann, Knut; and Schneider, Eckart, to Ernst Leitz G.m.b.H. Electro-optical step marker. 3,900,264, Cl. 356-111.000.

Heller, William C., Jr.: *See*—
Leatherman, Alfred F., 3,900,360.

Hemlab AG: *See*—
Corbett, Dennis Thomas; and Wilson, John, 3,900,611.

Hendershot, William B.: *See*—
Tallent, Michael W.; Hendershot, William B.; Swain, Allan L.; and Harrison, Ronnie M., 3,900,885.

Hendrickson, Paul S.: *See*—
Nelson, John P.; Page, Robert E.; and Hendrickson, Paul S., 3,900,364.

Hengelhaupt, Hans-Georg, to Triumph Werke Nurnberg A.G. Typewriter ribbon arrangement. 3,900,099, Cl. 197-159.000.

Henkel & Cie G.m.b.H.: *See*—
Germscheid, Hans Gunther; Friedemann, Wolfgang; and Geisler, Roland, 3,900,370.

Henmi, Hiroshi: *See*—
Aishima, Itsuho; Fukuma, Noboru; Sakura, Hisaya; Chayamiti, Hiroshi; Okamoto, Toshio; Doi, Yuzuru; and Henmi, Hiroshi, 3,900,678.

Henry, Allan L., to Stauffer Chemical Company. Bag packing apparatus. 3,900,055, Cl. 141-67.000.

Heppell, Douglas Fraser, to Raymond Lee Organization, Inc., The, a part interest. Electrically heated plastic pipe. 3,900,047, Cl. 138-33.000.

Hercules Incorporated: *See*—
Carpenter, Charles W., 3,900,354.
Haynes, James N., 3,900,683.

Herczog, Andrew; Layton, Margaret M.; and Rice, Dale W., to Corning Glass Works. Method of producing magnetic metal oxide films bonded to a substrate. 3,900,593, Cl. 427-53.000.

Herliczek, Siegfried H.: *See*—
Mattimoe, Paul T.; Motter, Theodore J.; Hofmann, John J.; and Herliczek, Siegfried H., 3,900,673.

Herman, Eugene T.; and McIntosh, Kenneth W., to Goodyear Tire & Rubber Company, The. Apparatus for stretching a tubular work piece. 3,900,280, Cl. 425-392.000.

Hernandez, Antonio Januario. Safe having a concealed compartment. 3,899,983, Cl. 109-54.000.

Herriott, Donald Richard: *See*—
Collier, Robert Jacob; and Herriott, Donald Richard, 3,900,737.

Herrmann, Albert: *See*—
Kleen, Gerhard; and Herrmann, Albert, 3,900,791.

Herwig, Walter: *See*—
Racky, Werner; Kleiner, Hans-Jerg; and Herwig, Walter, 3,900,444.

Herzhoff, Peter; Gref, Hans; Maus, Fritz; Platz, Stephan; Friedsam, Josef; Schweicher, Wolfgang; Behr, Rolf; Wasser, Willi; and Browatzki, Kurt, to Agfa-Gevaert Aktiengesellschaft. Process and apparatus for heating up and thermostating solutions of high solids content for coating of web materials at a given temperature and for lowering the viscosity of such solutions which have a structural viscosity. 3,900,326, Cl. 96-114.800.

Herzog, Rollie R.; and Alley, Robert P., to General Electric Company. Battery charging circuit. 3,900,783, Cl. 320-2.000.

Hessert, James E.: *See—*
Clampitt, Richard L.; and Hessert, James E., 3,900,406.

Hessner, Jorgen: *See—*
Bergh, Gunnar; Brass, Kjell; Hessner, Jorgen; and Varberg, Thomas, 3,900,343.

Hesston Corporation, Inc.: *See—*
White, Allen A.; Garrison, Harold Keith; and Brooks, Dean P., 3,899,966.

Heurlen, Olof Torgny. Holder for absorbent pads, such as infants napkins. 3,900,032, Cl. 128-290.00H.

Hewlett-Packard Company: *See—*
Girdner, William I.; and Miller, John H., III, 3,900,895.
Mott, Claude M.; and Clark, Richard J., 3,900,259.

Heymes, Rene: *See—*
Martel, Jacques; and Heymes, Rene, 3,900,468.

Hilado, Alfonso. Self-locking differential for motor vehicles. 3,899,939, Cl. 74-715.000.

Hildebrand, Dietrich; Kruckenberg, Winfried; Kuhnel, Werner; Molls, Hans Heinz; and Wolf, Karlheinz, to Bayer Aktiengesellschaft. Process for the dyeing of materials consisting of anion-modified polyacrylonitrile, polyamide and polyester fibres. 3,900,283, Cl. 8-21.00A.

Hiler, Roy R.; and Hohl, Robert W., to Penco Products Inc. Storage rack. 3,900,111, Cl. 211-177.000.

Hilfman, Lee, to Universal Oil Products Company. Removal of aromatic impurities. 3,900,388, Cl. 208-143.000.

Hilton, Paul G.: *See—*
Chruma, Jerry L.; and Hilton, Paul G., 3,900,597.

Hindermann, Peter: *See—*
Kolliker, Hans Peter; Karlen, Urs; and Hindermann, Peter, 3,900,496.

Hink, Karl M.: *See—*
Smith, Charles E.; Hink, Karl M.; Greening, Donald J., deceased; and Greening, Dorothy, executrix, 3,900,781.

Hinnant, Harris O., to Texaco Inc. Vibrator-type reflection seismic surveying. 3,900,825, Cl. 340-15.5TS.

Hirano, Yutaka: *See—*
Yamane, Tadayuki; and Hirano, Yutaka, 3,900,549.

Hirose, Kunio; and Mayeda, Akira, to Sanyo Electric Company, Ltd. Air bearing supported flexible disc device with oppositely rotating stabilization plate. 3,900,893, Cl. 360-99.000.

Hirs, Gene, to Hydromation Filter Company. Method of and apparatus for filtering. 3,900,395, Cl. 210-80.000.

Hiscox, Leonard Ramsey, to Girling Limited. Wheel slide protection system. 3,900,228, Cl. 303-21.0CG.

Hitachi, Ltd.: *See—*
Inoue, Tadao; and Nakamura, Takeo, 3,900,114.
Katayama, Yoshifumi; Kotera, Nobuo; Murayama, Yoshimasa; and Yoshida, Isao, 3,900,881.
Kobayashi, Toshio; Susa, Kenzo; and Taniguchi, Satoshi, 3,900,431.
Osakabe, Kuniharu; and Yonai, Fumiaki, 3,900,854.
Sakaguchi, Seiichiro, 3,900,366.
Takami, Norihiko; Hattori, Osamu; and Wakabayashi, Manabu, 3,899,827.
Tsuiki, Takao; and Hatsukano, Yoshikazu, 3,900,845.

Hitachi Shipbuilding and Engineering Co. Ltd.: *See—*
Goto, Toshiho; and Nishino, Yoshinori, 3,900,355.

Hitchiner Manufacturing Co., Inc.: *See—*
Chandley, George D.; and Lamb, John N., 3,900,064.

Hitomi, Nobuteru: *See—*
Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, 3,899,898.

Hivert, Andre: *See—*
Galmiche, Philippe Marie; and Hivert, Andre, 3,900,613.

Hjelmquist, Stig Gunnar. Sleds. 3,900,208, Cl. 280-16.000.

HMW Industries, Inc.: *See—*
Carriker, Roy C., 3,900,749.

Hockley, Bernard Spencer, to Rolls-Royce (1971) Limited. Method and apparatus for testing an object. 3,899,921, Cl. 73-67.200.

Hoeber, W. Gerhard: *See—*
Bystron, Bruno; Hoeber, W. Gerhard; and Goldammer, Georg, 3,899,949.

Hoechst Aktiengesellschaft: *See—*
Fuchs, Hermann; and Meininger, Fritz, 3,900,510.
Horlein, Gerhard; Salbeck, Gerhard; and Emmel, Ludwig, 3,900,499.
Irmscher, Klaus; Kramer, Josef; and Nowak, Herbert, 3,900,467.
Jahn, Helmut, 3,900,735.
Racky, Werner; Kleiner, Hans-Jerg; and Herwig, Walter, 3,900,444.
Radscheit, Kurt; Stache, Ulrich; Fritsch, Werner; and Haede, Werner, 3,900,502.
Winkelmann, Erhardt; and Raether, Wolfgang, 3,900,482.

Hoeft, Werner H.: *See—*
Knubbe, Keith; Hoeft, Werner H.; and Kelson, Gary, 3,900,821.

Hofer, Peter, to Georg Fischer Aktiengesellschaft. Method and means for connecting electrical conductors to railroad rails. 3,899,825, Cl. 228-107.000.

Hofer, Walter: *See—*
Haubner, Georg; Hofer, Walter; and Schmaldienst, Peter, 3,900,016.

Hoffmann-La Roche Inc.: *See—*
Cohen, Noal; De Silva, Wijitha; and Hueppi, Gerhard, 3,900,469.
Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Franziska, heir; Vogler, Niklaus E., heir; and Vogler, Heinrich, heir, 3,900,464.
Leimgruber, Willy; and Weigele, Manfred, 3,900,511.
Ning, Robert Ye-Fong; and Sternbach, Leo Henryk, 3,900,501.
Saucy, Gabriel, 3,900,491.

Hofmann, John J.: *See—*
Mattimoe, Paul T.; Motter, Theodore J.; Hofmann, John J.; and Herliczek, Siegfried H., 3,900,673.

Hoft, Donald J.; and Shutt, Philip R., to United States of America, Air Force. Split pulse generator. 3,900,799, Cl. 328-28.000.

Hohl, Robert W.: *See—*
Hiler, Roy R.; and Hohl, Robert W., 3,900,111.

Hohne, Karl; and Bogusch, Renate, to Siemens Aktiengesellschaft. Silver catalyst and a method of its manufacture. 3,900,342, Cl. 136-120.0FC.

Holcombe, Gordon B. Hand held device for activating a chemiluminescent wand. 3,900,728, Cl. 240-52.00R.

Holdsworth, Robert S.; O'Neill, Gerald J.; Simons, Charles W.; and DiBiasio, Vincent L., to W. R. Grace & Co. 1-Chloro-1-methyl-2,2,3,3-tetrafluorocyclobutane for general inhalation anesthetic. 3,900,568, Cl. 424-352.000.

Holl, Roland: *See—*
Theisz, Franz; Pollner, Max; and Holl, Roland, 3,900,193.

Holland, Kenneth C., to Tektronix Inc. Electrical contactor assembly for high frequency applications. 3,900,711, Cl. 200-238.000.

Holland, William P.; Azud, Robert E.; and Koller, Thomas J., to Machlett Laboratories, Inc., The. Rotating anode x-ray tube. 3,900,751, Cl. 313-60.000.

Holmes, Donald E.: *See—*
Larsen, Raymond B.; and Holmes, Donald E., 3,900,094.

Holotron Corporation: *See—*
St. John, Daniel S., 3,900,884.

Holtkamp, Donald A.: *See—*
Chichester, Willard L.; and Holtkamp, Donald A., 3,900,075.

Holtmyer, Marlin D.: *See—*
Chatterji, Jiten; Holtmyer, Marlin D.; and Tiner, Robert L., 3,900,070.

Honeywell Inc.: *See—*
Larsen, Larry D.; Schuck, Lee; Pekarek, Joseph C.; and Mott, Richard C., 3,900,795.
Wald, Leon D., 3,900,844.

Honeywell Information Systems, Inc.: *See—*
Hunter, John C., 3,900,837.

Honigmann, Ronald Louis: *See—*
Stiteler, Fred Zwald; and Honigmann, Ronald Louis, 3,900,010.

Honkasalo, Jorma Bruno: *See—*
Tuovinen, Frans Heikki; Blomquist, Seppo Ilmari; Heikkila, Risto Markus; Honkasalo, Jorma Bruno; and Kunttu, Kalevi Johan, 3,900,117.

Hooker Chemicals & Plastics Corporation: *See—*
Miller, George T., 3,900,327.
Miller, George T., 3,900,664.

Hooker, Mary L.: *See—*
Vida, Julius A.; and Hooker, Mary L., 3,900,475.

Hooper, Ira: *See—*
Berman, Herbert M.; and Hooper, Ira, 3,900,182.

Hope Kabushiki Kaisha: *See—*
Iizuka, Michio, 3,900,207.

Hoppe, Gerhard; Leppek, Heinrich; Rensmann, Leo; and Kehr, Helmut, to Veba-Chemie AG. Hot fusion coating masses. 3,900,361, Cl. 156-334.000.

Hoppe, Peter; Drouven, Gustav; Wandel, Martin; Gutschik, Ernst; and Brokmeier, Dieter, to Bayer Aktiengesellschaft. Heavy duty sandwich element. 3,900,651, Cl. 428-86.000.

Hoppmann Corporation: *See—*
Hoppmann, Kurt H., 3,900,107.

Hoppmann, Kurt H., to Hoppmann Corporation. Rotating method of sorting particulate articles. 3,900,107, Cl. 209-73.000.

Hoppner, Werner F.; and Shogren, David K., to Xerox Corporation. Exposure apparatus. 3,900,258, Cl. 355-51.000.

Horak, Josef: *See—*
Muck, Eduard; Strachota, Jaroslav; and Horak, Josef, 3,900,621.

Hori, Yuji: *See—*
Yada, Akira; and Hori, Yuji, 3,900,463.

Horiguchi, Shojiro: *See—*
Kawamura, Kimihide; and Horiguchi, Shojiro, 3,900,459.

Horlein, Gerhard; Salbeck, Gerhard; and Emmel, Ludwig, to Hoechst Aktiengesellschaft. (Thio) phosphoric acid and (thio) phosphonic acid esters and amides. 3,900,499, Cl. 260-327.0TH.

Hornstra, Gerard, to N.V. Internationale Octrooi Maatschappij "Octropa". Method and apparatus for determining the degree of platelet aggregation in blood. 3,900,290, Cl. 23-230.00B.

Horr, Claus: *See—*
Graber, Andreas; and Horr, Claus, 3,900,040.

Horsewell, Henry George; and Luke, John Anthony, to Brown & Williamson Tobacco Corporation. Tobacco-smoke filters. 3,900,037, Cl. 131-10.000.

Horsky, Eugene G.: *See—*
Koch, Walter T.; and Horsky, Eugene G., 3,900,356.

Hosono, Hiroo: *See—*
Sugaya, Hiroshi; and Hosono, Hiroo, 3,900,892.

Houseman, Henry J.; and Skulley, Gerald W., to Eaton Corporation. Operation lamp and steer indicator. 3,900,831, Cl. 340-52.00R.

Howe, Robert James: *See—*
Kelso, David Allen; and Howe, Robert James, 3,900,140.

Howells, Paul W., to Syracuse University Research Corporation. Wind-neutralizing passage. 3,899,960, Cl. 98-32.000.

Hoya Lens Co., Ltd.: *See—*
Hammond, Vivan Joseph; Norgate, Peter; Onoki, Fumio; Kamiya, Hajime; and Ohno, Kazuaki, 3,900,672.

Hoyler, Gerhard: *See—*
Behn, Reinhard; and Hoyler, Gerhard, 3,900,788.

Hoyt, Hazen L., III: *See—*
Bartlett, Fred J.; Bevis, Paul A.; Hoyt, Hazen L., III; and Mercer, Francis T., 3,900,405.

Huchette, Paul V.; and Hall, Homer H., Jr., to Edgewater Corporation. Composite material springs and manufacture. 3,900,357, Cl. 156-185.000.

Huckabee, Marvin L.: *See—*
Palmour, Hayne, III; and Huckabee, Marvin L., 3,900,542.

Huddle, Carl F., to Jon Vredevoogd; and Tension Structures Co., part interest to each. Method of erection for a pretensioned membrane structure. 3,899,854, Cl. 52-80.000.

Hudson, Paul S.: *See—*
Childs, William V.; Ashe, Benedict H., Jr.; and Hudson, Paul S., 3,900,372.

Hueppi, Gerhard: *See—*
Cohen, Noal; De Silva, Wijitha; and Hueppi, Gerhard, 3,900,469.

Huffman, Herman M.: *See—*
Swanson, Kenneth B.; and Huffman, Herman M., 3,899,889.

Hull, R. Dell. Closed face spinning reel. 3,900,167, Cl. 242-84.20A.

Hulse, Lauren L.: *See—*
Tanck, Elinor J.; Hulse, Lauren L.; and Kelly, Paul P., 3,900,414.

Hulsebos, Jan, to Cities Service Oil Company. Process for recovering dissolved copper from solutions containing copper. 3,900,314, Cl. 75-109.000.

Human Circle, Inc., The: *See—*
Piunno, Carmen, 3,900,018.

Humber, Leslie G.: *See—*
Philipp, Adolf H.; Demerson, Christopher A.; and Humber, Leslie G., 3,900,477.

Hunt, Harold R.; and Vanderveen, John W., to Phillips Petroleum Company. Apparatus and method for forming pellets. 3,900,547, Cl. 264-117.000.

Hunter, John C., to Honeywell Information Systems, Inc. Variably addressable semiconductor mass memory. 3,900,837, Cl. 340-173.00R.

Hunter, Willard I.: *See—*
Tress, Jack E.; and Hunter, Willard I., 3,900,696.

Hunter, Willard L.; White, Jack C.; and Stickney, William A., to United States of America, Interior. Preparation of highly pure titanium tetrachloride from perovskite or titanite. 3,900,552, Cl. 423-76.000.

Hunyar, Csaba K., to United Artists Music and Records Group, Inc. Phonograph record profile tracer. 3,899,832, Cl. 33-174.00P.

Huper, Fritz, to Bayer Aktiengesellschaft. Production of 6-aminopenicillanic acid. 3,900,488, Cl. 260-306.70C.

Hurst, John, to W. R. Grace & Co. Waterproofing means and method. 3,900,102, Cl. 206-411.000.

Husted, Royce H. Brake control valve including failsafe means for manually pumping brakes of a vehicle. 3,900,229, Cl. 303-52.000.

Hutz, Hugo. Lamp with tubular bulb and reflector. 3,900,727, Cl. 240-41.35R.

Hydromation Filter Company: *See—*
Hirs, Gene, 3,900,395.

Hygrade Foods Inc.: *See—*
Rapoport, Joseph, 3,900,575.

Ianney, George: *See—*
Lisbin, Arthur; Ianney, George; and Albanese, James, 3,900,133.

Ichimura, Takeo: *See—*
Tsunashima, Teruyoshi; Kaneko, Teruo; and Ichimura, Takeo, 3,900,249.

Ichise, Yoshio: *See—*
Yokota, Hiroomi; and Masuda, Taizo, 3,899,892.

ICI United States Inc.: *See—*
Wyhof, John R., 3,900,693.

Idler, Gustav: *See—*
Roller, Siegfried; and Idler, Gustav, 3,899,870.

Iffland, Roger L.: *See—*
Alling, Richard L.; and Iffland, Roger L., 3,900,235.

Ii, Masatake: *See—*
Soga, Hiromu; Minamida, Katsuhiro; Kurasawa, Kazuo; and Ii, Masatake, 3,900,887.

Iijima, Tetsuya, to Nissan Motor Co., Ltd. Change-speed transmission for passenger automobile. 3,899,940, Cl. 74-759.000.

Iijima, Yasuo, to Matsushita Electric Industrial Co., Ltd. Oil-impregnated capacitor. 3,900,774, Cl. 317-258.000.

Iizuka, Michio, to Hope Kabushiki Kaisha. Toe fixture for a ski safety binding. 3,900,207, Cl. 280-11.35T.

Ikeda, Richard Masayoshi; and Michel, Rudolph Henry, to du Pont de Nemours, E. I., and Company. Laminated film structure. 3,900,670, Cl. 428-308.000.

Illinois Tool Works Inc.: *See—*
Day, Robert H., 3,900,103.

Imperial Chemical Industries Limited: *See—*
Cassidy, John Edward, 3,900,331.
Edwards, John Wilmar; and Farrant, Barry William, 3,900,684.
Mathews, Carl Fraser; Nield, Eric; Rose, John Brewster; and Vincent, Peter Incledon, 3,900,531.

Inagaki, Tatsumi: *See—*
Masuda, Yoshikazu; and Inagaki, Tatsumi, 3,900,579.

Industrie Pirelli S.p.A.: *See—*
Angioletti, Attilio; and Brollo, Aurelio, 3,900,627.

Ing. C. Olivette & C., S.p.A.: *See—*
Ravera, Giovanni; Siletto, Giorgio; and Bellis, Carlo, 3,900,256.

Ingrip Fasteners, Inc.: *See—*
Brumlik, George C., 3,899,803.

Inose, Mitsuo, to Japan Patent Center Inc. Stick game set. 3,900,197, Cl. 273-1.00R.

Inoue, Shinichi: *See—*
Hamada, Michihiro; Maeda, Youji; and Inoue, Shinichi, 3,900,807.

Inoue, Shohei; Kanbe, Masaki; Takada, Tadamichi; Miyazaki, Nobuyuki; and Yokokawa, Masanori, to Nippon Oil Seal Industry Company Limited. Catalyst for copolymerizing epoxy compounds with carbon dioxide. 3,900,424, Cl. 252-428.000.

Inoue, Tadao; and Nakamura, Takeo, to Hitachi, Ltd. Crane apparatus. 3,900,114, Cl. 212-83.000.

Intec Corporation: *See—*
Merlen, Monty M.; and Nichols, Peter H., 3,900,265.

International Business Machines Corporation: *See—*
Aziz, Rahmat A., 3,900,894.
Beck, Wolfgang; Brunner, Friedrich C.; Frasch, Peter U.; Ivancic, Blanka; Schwerdt, Friedrich W.; and Vogtmann, Theodor, 3,900,337.
Gibson, David K., 3,900,192.
Griffiths, Donald E.; Kalthoff, Clement H.; and Laenen, Edward G., 3,900,891.
Kraft, Wayne R.; and Lowden, Robert P., 3,900,746.
Magdo, Ingrid E., 3,900,344.
Michail, Michel S.; Woodard, Ollie C.; and Yourke, Hannon S., 3,900,736.
Potter, Michael David, 3,900,352.
Salvo, George P., 3,900,836.
Spaulding, Edward C., 3,900,600.
Titus, Donald E.; and Tsao, Sherman H. M., 3,900,162.
Wiedmann, Siegfried Kurt, 3,900,838.

International Harvester Company: *See—*
Compton, William A.; Duffy, Thomas E.; and Seegall, Manfred I., 3,899,878.
Johnson, Otto E.; Frase, Roland J.; and Treptow, Ernest G., 3,900,201.

International Nickel Company, Inc., The: *See—*
Forbes Jones, Robin Mackay, 3,900,316.

International Paper Company: *See—*
Berkhouse, Thomas W., 3,900,158.

International Research and Development Company Limited: *See—*
Chadwick, Michael Dickenson; Jackson, Peter Woodall; and Brown, Derek James, 3,900,148.

International Standard Electric Corporation: *See—*
Kohler, Karl, 3,900,877.

International Telephone and Telegraph Corporation: *See—*
Anhalt, John William; and Goodman, David Samuel, 3,900,239.

Intreprinderea Metalul Rosu Cluj: *See—*
Constantinescu, Petre; Oachis, Emil; Trimbitas, Dorin; and Alexandrescu, Doina, 3,900,301.

Iowa State University Research Foundation, Inc.: *See—*
Gillette, Deighton D., 3,900,398.

Irie, Sadanao; Tomomoto, Kenichi; Akahori, Toyohiko; and Simomura, Kazuhisa, to Osaka Gas Company, Ltd.; and Kyushu Refractories Co., Ltd. Coal charging cover and seal for the coal charging hole of a coke oven. 3,900,369, Cl. 202-247.000.

Irmscher, Klaus; Kramer, Josef; and Nowak, Herbert, to Hoechst Aktiengesellschaft. Process for the manufacture of β13-oxo-7α-acetylthio-17 βhydroxy 4-androstene-17αyl)-propionic acidγ-lactone. 3,900,467, Cl. 260-239.55C.

Isaacson, Calvin M.: *See—*
Christensen, Carl W.; and Isaacson, Calvin M., 3,900,325.

Isham, Allan B.; and Shenk, Wilbur, III, to Owens-Corning Fiberglas Corporation. Reinforced thermoplastic pipe. 3,900,048, Cl. 138-144.000.

Ishige, Sadao: *See—*
Hayashi, Takao; Matsukawa, Hiroharu; and Ishige, Sadao, 3,900,217.

Ishikawa, Katsukiyo; and Shibata, Takayuki, to Nippon Paint Co., Ltd. Metallic can glued with synthetic resin product. 3,900,126, Cl. 220-75.000.

Itakura, Sigeru: *See—*
Nakayama, Ryozo; and Itakura, Sigeru, 3,900,657.

Italcementi S.p.A. Fabbriche Riunite Cemento: *See—*
Francardi, Mario Tullo, 3,900,291.

Ito, Shunji; Morioka, Yasuaki; Kajinaga, Yoshihiro; Sakurada, Ichio; and Nitta, Minoru, to Kawasaki Steel Corporation. Method of making metal piece having high density from metal powder. 3,899,821, Cl. 29-420.500.

Itogihan Company, Ltd.: *See—*
Kumagai, Naoki, 3,900,115.

Iura, Yukio: *See—*
Taguchi, Tatsuya; and Iura, Yukio, 3,900,856.

Ivancic, Blanka: *See—*
Beck, Wolfgang; Brunner, Friedrich C.; Frasch, Peter U.; Ivancic, Blanka; Schwerdt, Friedrich W.; and Vogtmann, Theodor, 3,900,337.

Ivani, Edward J., to Rynco Scientific Corporation. Semi-rigid, gas permeable contact lenses. 3,900,250, Cl. 351-160.000.

Ivey, John S., to Borg-Warner Corporation. One way fluid operated coupling. 3,900,089, Cl. 192-85.0AA.

Iwasaki, Shozo, to Kabushiki Kaisha Akashi Seisakusho. Dial indicator for sensing surface variations. 3,899,931, Cl. 74-34.000.

J. G. Anschutz GmbH: *See*—
Wild, Hermann; and Rau, Arthur, 3,899,845.

J. H. Channon, Inc.: *See*—
Roller, Max F., 3,900,063.

J. Koehle KG: *See*—
Koehle, Joachim, 3,899,802.

J & S Aluminum Inc.: *See*—
Soroka, John, 3,900,110.

Jackson, George Edward, to Union Carbide Corporation. Warp knitted garments and apparatus and method for making the same. 3,899,900, Cl. 66-87.000.

Jackson, Harold Leonard, to du Pont de Nemours, E. I., and Company. Exhaust disperse dycing of synthetic polymers utilizing a saturated liquid fluorocarbon. 3,900,287, Cl. 8-174.000.

Jackson, Larry L. Centrifugal auto-priming pump. 3,900,273, Cl. 415-88.000.

Jackson, Peter Woodall: *See*—
Chadwick, Michael Dickenson; Jackson, Peter Woodall; and Brown, Derek James, 3,900,148.

Jacobson, Amnon. Solution comprising a lacrymator. 3,900,560, Cl. 424-45.000.

Jacoby, Henry C.: *See*—
Woodman, Gerald A.; Uscher, Joseph; and Jacoby, Henry C., 3,900,641.

Jahn, Helmut, to Hoechst Aktiengesellschaft. Corona discharge apparatus. 3,900,735, Cl. 250-324.000.

Jakob, Hans, to Maschinenfabrik Goebel, GmbH. Adjustment arrangement for circular slitting knives. 3,899,948, Cl. 83-497.000.

James, Alec Patrick, to National Research Development Corporation. Ticket issuing and collection systems. 3,900,715, Cl. 235-61.70R.

Janson, Thomas R.: *See*—
Katz, Joseph J.; and Janson, Thomas R., 3,900,034.

Japan Patent Center Inc.: *See*—
Inose, Mitsuo, 3,900,197.

Jaswal, Iqbalsingh; and Pugi, Kalev, to Du Pont of Canada, Ltd. Preparation of Polyamides by continuous polymerization. 3,900,450, Cl. 260-78.00R.

Jayne, Laurence I.; and Magnuson, Roland A., to Pacific Car and Foundry Company. Empty cartridge forward ejection mechanism for rapid fire weapon. 3,899,954, Cl. 89-33.00F.

Jen, Dixson Teh-Chao: *See*—
Casey, Richard C.; Duggan, Robert J.; Grosky, Stephen A.; Jen, Dixson Teh-Chao; Serra, John J.; Whitehead, Donald Shaffer; and Boyce, Thomas E., 3,900,834.

Jennewein, Hans-Michael: *See*—
Konz, Wilhelm; Waldeck, Franz; and Jennewein, Hans-Michael, 3,900,566.

Jennings, Donald G., to Distribution Supply Corporation. Press for pallet disassembly. 3,899,816, Cl. 29-200.00D.

Jensen, Garold K., to United States of America, Navy. Radar signal analyzing system. 3,900,869, Cl. 343-7.700.

Jensen, Garold K.; and McGeogh, James E., to United States of America, Navy. Contiguous filter tracking window for radar. 3,900,871, Cl. 343-8.000.

Jensen, Garold K.; and McGeogh, James E., to United States of America, Navy. Radar data converter and display system. 3,900,872, Cl. 343-9.000.

Jiles, Overton Jackson. Transmission control apparatus for a vehicle or the like. 3,899,935, Cl. 74-473.00R.

Jin, Jung Il: *See*—
Kraft, Paul; and Jin, Jung Il, 3,900,455.

Jinnette, Jimmy Gray. Automatic sequence unit for product feeding to live stock. 3,900,008, Cl. 119-51.130.

John Laing and Son Limited: *See*—
Newby, Ronald, 3,900,279.

Johnson, Gordon E.: *See*—
Lindblad, Nero R.; Johnson, Gordon E.; and Sharp, James H., 3,900,589.

Johnson, John David. Property boundary marker. 3,899,856, Cl. 52-98.000.

Johnson, Keith G.; and Limbach, Anthony Paul, to ARCO Polymers, Inc. Method for the continuous extrusion of multiple small cross-section thermoplastic polymeric resinous foam profiles. 3,900,544, Cl. 264-45.500.

Johnson, Marvin F. L., to Atlantic Richfield Company. Method of determining catalytic activity by measuring the relative reflectance of the catalyst. 3,900,267, Cl. 356-209.000.

Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., to Phillips Petroleum Company. Selective removal of 1,2 Polyenes and acetylenic compounds from conjugated-diene feed using a nickel, iron or cobalt arsenide catalyst. 3,900,526, Cl. 260-681.500.

Johnson, Otto E.; Frase, Roland J.; and Treptow, Ernest G., to International Harvester Company. Semi-mounted carrier. 3,900,201, Cl. 280-5.00H.

Johnson, Wallace J. S., to Up-Right, Inc. Processing of fruit without exposure to air. 3,900,571, Cl. 426-15.000.

Johnson, William H., to Research Corporation. Modular tobacco handling and curing system and method. 3,899,836, Cl. 34-225.000.

Johnsson, Berndt-Ola Folke, to Moderna Butiksinredningar AB. Watching mirror. 3,900,243, Cl. 350-6.000.

Johnston, Arch D.: *See*—
Geisler, Robert L.; Koury, James L.; and Johnston, Arch D., 3,899,919.

Johnston, Richard Paul; and Levins, Dave Baer, to General Electric Company. Remote controlled actuation system for the rotor of a gas turbine engine. 3,900,274, Cl. 416-155.000.

Jon Vredevoogd: *See*—
Huddle, Carl F., 3,899,854.

Jones, John L.: *See*—
Gilman, William S.; Jones, John L.; and Rubino, Andrew M., 3,900,620.

Jones & Laughlin Steel Corporation: *See*—
Rehmus, Frederick H., 3,900,304.

Jones, Spencer D.: *See*—
Rea, Donald E., 3,900,080.

Jordan, Richard James. High voltage pulse generating circuit. 3,900,786, Cl. 321-2.000.

Josephson, Edgar F., to ACF Industries, Incorporated. Baffled bulk shipment of perishable lading in insulating box cars and refrigerator cars. 3,899,981, Cl. 105-355.000.

Jourdan-Laforte, Eric, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process for generating an oxidizing reagent for the treatment of polluted water. 3,900,555, Cl. 423-365.000.

Joy Manufacturing Company: *See*—
Spehrley, Charles W., 3,900,299.

Judd, Robert R.: *See*—
Chao, Hung-Chi; Gross, John H.; Judd, Robert R.; and Rueckl, Roger L., 3,900,309.

Jurny, Josef; and Sedlak, Vaclav, to Adamovske Strojirny, narodni podnik. Apparatus for transferring paper sheets between successive printing units. 3,899,970, Cl. 101-230.000.

Jurrens, Lawrence D., to Phillips Petroleum Company. Hot melt adhesive containing amorphous polypropylene. 3,900,694, Cl. 428-513.000.

Justice, Neil: *See*—
Keyes, Richard E.; and Justice, Neil, 3,899,984.

JWI Ltd.: *See*—
MacBean, Donald George, 3,900,659.

K A Bergs Smide AB: *See*—
Berg, Bengt Frans Allan, 3,899,806.

K & H Products, Ltd.: *See*—
Kelso, David Allen; and Howe, Robert James, 3,900,140.

Kaasila, Kauko Johannes; Toivanen, Toivo Adrian; Harkki, Seppo Untamo; Neimela, Toivo Isak; Makipirtti, Simo A.; Malmstrom, Rolf E.; Tuominen, Tapio Kalevi; Aaltonen, Olavi August; and Noponen, Veikko H., to Outokumpu Oy. Process for suspension smelting of finely-divided oxide and/or sulfide ores and concentrates. 3,900,310, Cl. 75-23.000.

Kabas, Guglielmo: *See*—
Schlapfer, Hans; and Kabas, Guglielmo, 3,900,419.

Kabushiki Kaisha Akashi Seisakusho: *See*—
Iwasaki, Shozo, 3,899,931.

Kabushiki Kaisha Suwa Seikosha: *See*—
Nagasaki, Osamu, 3,900,248.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Komatsu, Noboru; Kamigaito, Osami; Suzuki, Takatoshi; Doi, Haruo; Sano, Kazuya; Yamamoto, Nobuyuki; Kandori, Toshio; and Tsuzuki, Yukikazu, 3,900,429.

Kajinaga, Yoshihiro: *See*—
Ito, Shunji; Morioka, Yasuaki; Kajinaga, Yoshihiro; Sakurada, Ichio; and Nitta, Minoru, 3,899,821.

Kallianos, Andrew G.; Warfield, Albert H.; and Simpson, Melvyn I., to Liggett & Myers Incorporated. 3,5-Disubstituted-2-hydroxyacetophenones. 3,900,521, Cl. 260-592.000.

Kalthoff, Clement H.: *See*—
Griffiths, Donald E.; Kalthoff, Clement H.; and Laenen, Edward G., 3,900,891.

Kaman, Charles H.: *See*—
Bell, C. Gordon; Buzynski, John E.; Kaman, Charles H.; and O'Loughlin, James F., 3,900,835.

Kamaya, Naoki, to Sony Corporation. Tape cassette. 3,900,172, Cl. 242-198.000.

Kamigaito, Osami: *See*—
Komatsu, Noboru; Kamigaito, Osami; Suzuki, Takatoshi; Doi, Haruo; Sano, Kazuya; Yamamoto, Nobuyuki; Kandori, Toshio; and Tsuzuki, Yukikazu, 3,900,429.

Kamiya, Hajime: *See*—
Hammond, Vivan Joseph; Norgate, Peter; Onoki, Fumio; Kamiya, Hajime; and Ohno, Kazuaki, 3,900,672.

Kamiyama, Hiromitsu: *See*—
Akimoto, Hideo; and Kamiyama, Hiromitsu, 3,900,740.

Kanbe, Masaki: *See*—
Inoue, Shohei; Kanbe, Masaki; Takada, Tadamichi; Miyazaki, Nobuyuki; and Yokokawa, Masanori, 3,900,424.

Kandori, Toshio: *See*—
Komatsu, Noboru; Kamigaito, Osami; Suzuki, Takatoshi; Doi, Haruo; Sano, Kazuya; Yamamoto, Nobuyuki; Kandori, Toshio; and Tsuzuki, Yukikazu, 3,900,429.

Kanebo, Ltd.: *See*—
Uraya, Tohru; and Kudo, Eichi, 3,900,652.

Kaneko, Teruo: *See*—
Tsunashima, Teruyoshi; Kaneko, Teruo; and Ichimura, Takeo, 3,900,249.

Kanrich, Nathaniel G.: *See*—
Gadsby, William, 3,899,855.

Kanzaki, Yoshiharu: *See*—
Tsukada, Kazuo; Sunagawa, Mitsuru; and Kanzaki, Yoshiharu, 3,900,876.

Kaplan, Sam H., to Zenith Radio Corporation. Shadow mask and phosphor screen for color cathode ray tube having major axes of apertures and elements canted to beam scan direction. 3,900,757, Cl. 313-402.000.
Karlen, Urs: *See—*
Kolliker, Hans Peter; Karlen, Urs; and Hindermann, Peter, 3,900,496.
Karrer, Friedrich; and Farooq, Saleem, to Ciba-Geigy Corporation. Ether and thioether containing thiolesters. 3,900,507, Cl. 260-455.00R.
Katayama, Yoshifumi; Kotera, Nobuo; Murayama, Yoshimasa; and Yoshida, Isao, to Hitachi, Ltd. Negative resistance device and method of controlling the operation. 3,900,881, Cl. 357-3.000.
Kato, Hajime; and Hayashi, Takao, to Fuji Photo Film Co., Ltd. Record sheet. 3,900,215, Cl. 282-27.500.
Kato, Mitsuru: *See—*
Sato, Akihiro; Takeda, Saburo; Konotsune, Shiro; Kato, Mitsuru; and Tonoike, Takao, 3,900,454.
Katz, Joseph J.; and Janson, Thomas R., to United States of America, Energy Research and Development Administration. Photochemical stimulation of nerves. 3,900,034, Cl. 128-395.000.
Kaufman, Benjamin, to Colgate-Palmolive Company. Composition for cleaning and glazing furs. 3,900,407, Cl. 252-8.570.
Kaufman, Lance R., to Gentron Corporation. Electric fence shocker circuit. 3,900,770, Cl. 317-148.50B
Kaukeinen, Ralph M., to Corning Glass Works. Filtering extrusion batch material. 3,900,546, Cl. 264-102.000.
Kawabata, Hidetsugu, Yamashita, Toshio; Uda, Hiroshi; Yoshida, Manabu; and Kitamura, Saburo, to Matsushita Electric Industrial Co., Ltd. Optical static card reader. 3,900,716, Cl. 235-61.11E.
Kawada, Takehiko, to Denki Onkyo Company, Ltd. Corona discharge apparatus for particle collection. 3,900,766, Cl. 317-3.000.
Kawahara, Yukio: *See—*
Makishima, Hiroshi; Shinohara, Toshio; Kawahara, Yukio; Nii, Hiroshi; and Ebine, Setsuo, 3,900,630.
Kawakami, Ken-Ichi; Hatada, Kenji; and Yamaguchi, Yasuhiko, to Toray Industries, Inc. Method for surface treatment of plastics. 3,900,538, Cl. 264-22.000.
Kawamoto, Tamio: *See—*
Sakamoto, Kenichi; and Kawamoto, Tamio, 3,900,082.
Kawamura, Kimihide; and Horiguchi, Shojiro, to Dainichiseika Color & Chemicals Mfg. Co., Ltd. Process for preparing high molecular weight azo pigment. 3,900,459, Cl. 260-157.000.
Kawasaki Steel Corporation: *See—*
Ito, Shunji; Morioka, Yasuaki; Kajinaga, Yoshihiro; Sakurada, Ichio; and Nitta, Minoru, 3,899,821.
Kawashima, Teruaki, to Yoshida Kogyo Kabushiki Kaisha. Slider. 3,899,804, Cl. 24-205.15R.
Kay, Carl Joseph, to Products Research & Chemical Corporation. Method and composition for repairing asphalt pavement. 3,900,439, Cl. 260-28.5AS.
Keedwell, Cyril A., to Pall Corporation. Process for preparing integral absorbent pad bandages and product. 3,900,027, Cl. 128-268.000.
Keeffe, William M.: *See—*
Bamberg, William I.; and Keeffe, William M., 3,900,750.
Kehr, Helmut: *See—*
Hoppe, Gerhard; Leppek, Heinrich; Rensmann, Leo; and Kehr, Helmut, 3,900,361.
Keiper, Fritz: *See—*
Wirtz, Egon; and Werner, Paul, 3,900,225.
Kellogg, James R. Loading tailgate for trucks. 3,900,118, Cl. 214-84.000.
Kelly, Paul P.: *See—*
Tanck, Elinor J.; Hulse, Lauren L.; and Kelly, Paul P., 3,900,414.
Kelly, William F.; and Anderson, Robert B. Post-tensioned prestressed pile assembly. 3,899,891, Cl. 61-56.000.
Kelso, David Allen; and Howe, Robert James, to K & H Products, Ltd. Rotatable carrying apparatus for video tape cameras and similar items. 3,900,140, Cl. 224-5.00V.
Kelson, Gary: *See—*
Knubbe, Keith; Hoeft, Werner H.; and Kelson, Gary, 3,900,821.
Kendall Company, The: *See—*
Ginger, Roger D.; and Samour, Carlos M., 3,900,474.
Stanley, Leonard A.; and Fouche, Glynn E., Jr., 3,899,810.
Vida, Julius A.; and Hooker, Mary L., 3,900,475.
Kennedy, Kurt D.; and Scheuermann, Glen R., to Airco, Inc. Method for coating a substrate to provide a titanium or zirconium nitride or carbide deposit having a hardness gradient which increases outwardly from the substrate. 3,900,592, Cl. 427-39.000.
Kerr-McGee Chemical Corporation: *See—*
Fairchild, James Logan, 3,900,292.
Kerr-McGee Corporation: *See—*
Chappelow, Cecil C., Jr.; and Engel, James F., 3,900,514.
Kersch, Keith M.; Pouska, George A.; Drayer, Dennis E.; and Tackett, James E., Jr., to Marathon Oil Company. Modification of particle hardness in waxy crude oil slurries. 3,900,041, Cl. 137-13.000.
Kessler, Harry T., Jr.: *See—*
Anderson, Ronald L.; and Kessler, Harry T., Jr., 3,900,036.
Ketzer, Manfred, to U.S. Philips Corporation. Recording and/or playback apparatus. 3,900,173, Cl. 242-201.000.
Keyes, Richard E.; and Justice, Neil, to Finn Equipment Company, The. Device generating and directing a flow of combustion supporting gaseous media. 3,899,984, Cl. 110-18.00R.
Khirdzhiev, Sergei Grigorievich: *See—*
Somov, Boris Stepanovich; Mamin, Alexandr Ilich; Novikov, Andrei Porfirievich; Filippov, Vyacheslav Ivanovich; Khirdzhiev, Sergei Grigorievich; Gurevich, Vladimir Zakharovich; Voronov, Nikolai Stefanovich; and Agafonov, Ivan Fedorovich, 3,899,908.
Kiefer, Jurg: *See—*
Rembold, Heinz; Haug, Theobald; Wyler, Sigfried; and Kiefer, Jurg, 3,900,449.
Kihara Sangyo Kabushiki Kaisha: *See—*
Kihara, Sueo, 3,899,798.
Kihara, Sueo, to Kureha Kagaku Kogyo K.K.; and Kihara Sangyo Kabushiki Kaisha. Method for manufacturing insole for a shoe. 3,899,798, Cl. 12-146.00B.
Kim, He B., to Westinghouse Electric Corporation. Light-emitting diode which generates light in three dimensions. 3,900,863, Cl. 357-17.000.
Kimball, John J.: *See—*
D'Amato, Salvatore F.; Kimball, John J.; and Lednicer, Oliver, 3,900,219.
Kimberly-Clark Corporation: *See—*
Endres, Dan D.; and Lafond, Esther M., 3,900,031.
Robinson, James E., 3,900,632.
Kimura, Masakazu; Nanamatsu, Satoshi; Doi, Kikuo; and Matsushita, Shigeo, to Nippon Electric Company Limited. Lanthanum titanate single crystal electro-optic modulator. 3,900,246, Cl. 350-150.000.
King, Henry L.; and McGee, John W., to Monsanto Company. Production of basic dyeable polyester from terephthalic acid. 3,900,527, Cl. 260-75.00S.
King, Thomas Y., to Armstrong Cork Company. Zinc and molybdenum-containing compounds as smoke depressants for poly(vinyl chloride) resin compositions. 3,900,441, Cl. 260-31.8HA.
Kingston-Warren Corporation, The: *See—*
Azzi, Victor D.; and Wyeth, John, 3,900,112.
Kinsolving, C. Richard, to Richardson-Merrell Inc. Method of measuring histamine release from mast cells. 3,900,558, Cl. 424-8.000.
Kiritani, Masataka, to Fuji Photo Film Co., Ltd. Pressure-sensitive recording sheet with microcapsules having polyurea walls. 3,900,669, Cl. 428-307.000.
Kirk, Lawrence J.; and Baldwin, Marshall G., to Colgate-Palmolive Company. Mounting device. 3,900,059, Cl. 150-1.000.
Kirsch, Jordan: *See—*
Doyle, Robert O.; Kirsch, Jordan; and Thomis, Wendl, 3,900,251.
Kisbany, Frederick N. Laboratory wear resistance test machine for tires. 3,899,917, Cl. 73-8.000.
Kitai, Kiyoshi, to Seiko Koki Kabushiki Kaisha. Clock with dial illumination. 3,899,871, Cl. 58-50.00R.
Kitamura, Saburo: *See—*
Hasegawa, Nobuo; Yamashita, Toshio; and Kitamura, Saburo, 3,900,883.
Kawabata, Hidetsugu; Yamashita, Toshio; Uda, Hiroshi; Yoshida, Manabu; and Kitamura, Saburo, 3,900,716.
Kitchens of Sara Lee (Canada) Ltd.: *See—*
Hamer, Brian; and Doman, David G., 3,900,054.
Kiyono, Tetsuhiro, to Alps Electric Co., Ltd. Electromagnetic driven variable resistance device. 3,900,816, Cl. 338-116.000.
Kizu, Taisuke: *See—*
Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, 3,899,898.
Klapwijk, Dick, to Bouweconomisch en Technologisch Adviesbureau B.V. Method of restoring a wooden beam. 3,900,541, Cl. 264-35.000.
Kleen, Gerhard; and Herrmann, Albert, to Siemens Aktiengesellschaft. Voltage transformer for completely insulated, metal-clad high-voltage installations. 3,900,791, Cl. 323-93.000.
Klein, Aaron David: *See—*
Marriott, Carroll L.; Patzer, Hans E.; Hall, Ronald D.; Caposell, Charles D.; and Klein, Aaron David, 3,900,353.
Klein, Richard Edward, to Eaton Corporation. Strain gauge system. 3,899,924, Cl. 73-141.00A.
Kleiner, Hans-Jerg: *See—*
Racky, Werner; Kleiner, Hans-Jerg; and Herwig, Walter, 3,900,444.
Klier, Werner Adolph. Lawn mower. 3,899,866, Cl. 56-13.800.
Kline, Robert J., to Minnesota Mining and Manufacturing Company. Developed image transfer. 3,900,591, Cl. 427-24.000.
Kluge, Karl-Heinz; and Eppich, Alfred, to Leipold, F. Xavier. Decalcomania with removable lacquer coating. 3,900,643, Cl. 428-40.000.
Knapp, Heinrich: *See—*
Bundesen, Lorenz; Brettschneider, Johannes; and Knapp, Heinrich, 3,900,014.
Knauf, Karl, to Gebruder Knauf Westdeutsche Gipswerke. Mortars and the like. 3,900,333, Cl. 106-109.000.
Knight, Albert E. Adjustable blade and carrying means. 3,900,072, Cl. 172-238.000.
Knubbe, Keith; Hoeft, Werner H.; and Kelson, Gary, to Signetics Corporation. Integrated frequency selective demodulation circuit. 3,900,821, Cl. 329-122.000.
Knuth, Kurt: *See—*
Fleischer, Wolfgang; and Knuth, Kurt, 3,900,880.
Kobayashi, Toshio; Susa, Kenzo; and Taniguchi, Satoshi, to Hitachi, Ltd. Photoconductive material comprising a solid solution of (Cd,Pb)S. 3,900,431, Cl. 252-501.000.
Kobelt, Jack R. Engine remote control. 3,900,090, Cl. 192-.094.
Koch, Friedhelm; and Siepermann, Walter. Roll press. 3,899,965, Cl. 100-155.000.
Koch, Hans Joachim: *See—*
Thoma, Wilhelm; Noll, Klaus; Pedain, Josef; and Koch, Hans Joachim, 3,900,688.

Koch, Walter T.; and Horsky, Eugene G., to FMC Corporation. Method for making a cellular cushioning structure. 3,900,356, Cl. 156-145.000.

Kocks, Friedrich; and Lippert, Hans Joachim, to Kocks, Friedrich. Apparatus for casting hollow ingots. 3,900,067, Cl. 164-332.000.

Koehle, Joachim, to J. Koehle KG. Fastener means for an article of jewelry. 3,899,802, Cl. 24-73.0HR.

Koehler, Rudolph: *See—*
Beck, Henry T.; and Koehler, Rudolph, 3,900,278.

Kohler, Karl, to International Standard Electric Corporation. Elevation measuring device for phase-interferometer aircraft landing system. 3,900,877, Cl. 343-108.00M.

Kojima, Tamotsu: *See—*
Fujimatsu, Wataru; Sato, Shui; Kojima, Tamotsu; Endo, Takaya; and Minahara, Kazumi, 3,900,483.

Kolite Semiconductor Products, Inc.: *See—*
Kurtz, Anthony D.; Brosh, Amnon; Gravel, Charles L.; and Mallon, Joseph R., 3,900,811.

Koller, Thomas J.: *See—*
Holland, William P.; Azud, Robert E.; and Koller, Thomas J., 3,900,751.

Kolliker, Hans Peter; Karlen, Urs; and Hindermann, Peter, to Ciba-Geigy AG. Anthraquinone dyestuffs. 3,900,496, Cl. 260-326.00C.

Komatani, Taro; Yamada, Kazuo; Oguri, Eizo; and Tokuda, Yasunori, to Takeda Chemical Industries, Ltd. Process for concentrating a polysaccharide suspension. 3,900,462, Cl. 260-209.00R.

Komatsu, Noboru; Kamigaito, Osami; Suzuki, Takatoshi; Doi, Haruo; Sano, Kazuya; Yamamoto, Nobuyuki; Kandori, Toshio; and Tsuzuki, Yukikazu, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Catalyst for purifying exhaust gases. 3,900,429, Cl. 252-462.000.

Komon, John F., to Aqua-Marine Manufacturing Limited. Navigation light for boats. 3,900,725, Cl. 240-7.500.

Kondratenko, Ivan Yakovlev, to Nipkiep. Starting and regulator device for asynchronous motors with a wound rotor. 3,900,779, Cl. 318-197.000.

Kondrot, Leonard V.: *See—*
Freck, James A.; O'Rell, Dale H.; and Kondrot, Leonard V., 3,900,573.

Konersmann, Erhard; and Gruber, Rudolf, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Method and apparatus for applying an installation dimension to a bevel gear. 3,900,720, Cl. 235-151.320.

Konishiroku Photo Industry Co., Ltd.: *See—*
Akimoto, Hideo; and Kamiyama, Hiromitsu, 3,900,740.
Fujimatsu, Wataru; Sato, Shui; Kojima, Tamotsu; Endo, Takaya; and Minahara, Kazumi, 3,900,483.

Konon, Jury Alexeevich: *See—*
Apalikov, Jury Ignatievich; Konon, Jury Alexeevich; Pervukhin, Leonid Borisovich; and Tsemakhovich, Boris Davydovich, 3,900,147.

Konotsune, Shiro: *See—*
Sato, Akihiro; Takeda, Saburo; Konotsune, Shiro; Kato, Mitsuru; and Tonoike, Takao, 3,900,454.

Konz, Wilhelm; Waldeck, Franz; and Jennewein, Hans-Michael, to Boehringer Ingelheim GmbH. Pharmaceutical compositions containing the tert butyl ester of N-[(1-carboxy-L-prolyl)-oxy]-succinimide and method of use. 3,900,566, Cl. 424-274.000.

Koppers Company, Inc.: *See—*
Garrett, Clyde Barner; and Thayer, William Stansbury, 3,899,945.
Greco, Nicholas P., 3,900,522.

Korejwa, Alfred; Layer, Walter J.; and Ruda, Richard E., to Amerace Corporation. Process for producing oblong hose. 3,900,545, Cl. 264-89.000.

Korf, Erich: *See—*
Aust, Gert-Rudiger; Hainy, Siegfried; and Korf, Erich, 3,900,861.

Korman, Samuel: *See—*
Sheer, Charles; Korman, Samuel; Angier, Derek J.; and Cahn, Robert P., 3,900,762.

Korsell, Torsten: *See—*
Andersson, Conny; Hanas, Bertil; Korsell, Torsten; and Nilsson, Jan, 3,900,695.

Koryagin, Vladimir Vasilievich: *See—*
Privalov, Petr Leonidovich; Makurin, Pavel Semenovich; Plotnikov, Valerian Valerievich; Koryagin, Vladimir Vasilievich; Polpudnikov, Viktor Sergeevich; and Stepanjuk, Georgy Pavlovich, 3,899,918.

Kosel, George E., to Philip A. Hunt Chemical Corporation. Liquid toners with an amphipathic graft type polymeric molecule. 3,900,412, Cl. 252-62.100.

Koster, Manfred, to Braun Aktiengesellschaft. Adapter for automatically adapting DC equipment for energization by a first or second AC voltage of different amplitudes. 3,900,787, Cl. 321-15.000.

Kotera, Nobuo: *See—*
Katayama, Yoshifumi; Kotera, Nobuo; Murayama, Yoshimasa; and Yoshida, Isao, 3,900,881.

Koubek, Michael. Thyristor switching power circuit. 3,900,789, Cl. 321-47.000.

Koury, James L.: *See—*
Geisler, Robert L.; Koury, James L.; and Johnston, Arch D., 3,899,919.

Koval, Leonid Petrovich: *See—*
Tjutjunnikov, Anatoly Borisovich; Tjutjunnikov, Boris Nikanorovich; Marchenko, Alexandr Nikolaevich; Burin, Viktor Leontievich; Bolotin, Josif Mironovich; Drozdov, Anatoly Sergeevich; Koval, Leonid Petrovich; Didenko, Zoya Vasilievna; Ljubushkin, Georgy Vasilievich; Budnik, Jury Mikhailovich; Moskvin, Vladimir Dmitrievich; and Bolyanovsky, Dmitry Mikhailovich, 3,900,537.

Krackeler, Joseph J.; and Biddell, William G., to National Distillers and Chemical Corporation. Flame retardant polyethylene composition and coating process. 3,900,533, Cl. 260-897.00A.

Kraft, Paul; and Jin, Jung Il, to Stauffer Chemical Company. Process to emulsion polymerize vinyl chloride. 3,900,455, Cl. 260-92.80W.

Kraft, Wayne R.; and Lowden, Robert P., to International Business Machines Corporation. Voltage level conversion circuit. 3,900,746, Cl. 307-264.000.

Kraftco Corporation: *See—*
Warwick, Leonard A., 3,900,574.

Kralowetz, Bruno. Tool for machining round sections. 3,899,814, Cl. 29-105.00R.

Kramer, Josef: *See—*
Irmscher, Klaus; Kramer, Josef; and Nowak, Herbert, 3,900,467.

Krapcho, John, to E. R. Squibb & Sons, Inc. 2-Methyl-2-piperidino-3'-(trifluoromethyl) propiophenone. 3,900,478, Cl. 260-293.800.

Krause, Gerhard. Transistor with high current density. 3,900,771, Cl. 317-235.00R.

Krenzer, John, to Velsicol Chemical Corporation. New substituted 1,2-,4-thiadiazolidine-3,5-diones. 3,900,485, Cl. 260-302.00D.

Krenzer, John: *See—*
Richter, Sidney B.; and Krenzer, John, 3,900,497.

Kreyenborg, Joachim; and Kreyenborg, Udo. Filter apparatus for extrusion presses. 3,900,399, Cl. 210-236.000.

Kreyenborg, Udo: *See—*
Kreyenborg, Joachim; and Kreyenborg, Udo, 3,900,399.

Krieger, Bernhard: *See—*
Drawert, Manfred; Griebsch, Eugen; Krieger, Bernhard; Schepp, Horst; and Burba, Christian, 3,900,436.

Kriegner, Walter: *See—*
Gluck, Maternus; Eder, Bernhard; and Kriegner, Walter, 3,899,850.

Kruck, Ralph E., to VCA Corporation. Package having bottle support member therein. 3,900,121, Cl. 215-12.00R.

Kruckenberg, Winfried: *See—*
Hildebrand, Dietrich; Kruckenberg, Winfried; Kuhnel, Werner; Molls, Hans Heinz; and Wolf, Kartheinz, 3,900,283.

Krugler, Allen D., Jr.: *See—*
Boerger, David H.; Krugler, Allen D., Jr.; and Willoughby, Donald A., 3,899,897.

Kubo, Shunichi: *See—*
Sato, Tadashi; and Kubo, Shunichi, 3,900,003.

Kuchek, Henry A., to Dow Chemical Company, The. Composite magnesium-titanium conductor. 3,900,296, Cl. 29-197.000.

Kudo, Eichi: *See—*
Uraya, Tohru; and Kudo, Eichi, 3,900,652.

Kuehn, Donald E.; and Lyon, John Keith, to TRW Inc. Apparatus for handling parts. 3,900,132, Cl. 221-251.000.

Kuhnel, Werner: *See—*
Hildebrand, Dietrich; Kruckenberg, Winfried; Kuhnel, Werner; Molls, Hans Heinz; and Wolf, Karlheinz, 3,900,283.

Kukulowicz, Adolph F. Tandem wheeled roller skate. 3,900,203, Cl. 280-11.200.

Kullmann, Dieter; and Marsing, Helmut, to Siemens Aktiengesellschaft. Absorption apparatus for adjacently disposed magnet coils. 3,900,809, Cl. 335-216.000.

Kumagai, Naoki, to Itogihan Company, Ltd. Apparatus for supplying thin, flat articles. 3,900,115, Cl. 214-1.00Q.

Kummer, Franz: *See—*
Mai, Gerhard; Siepmann, Reiner; and Kummer, Franz, 3,900,428.

Kunttu, Kalevi Johan: *See—*
Tuovinen, Frans Heikki; Blomquist, Seppo Ilmari; Heikkila, Risto Markus; Honkasalo, Jorma Bruno; and Kunttu, Kalevi Johan, 3,900,117.

Kuntzel, Heiner: *See—*
Dubs, Paul; Kuntzel, Heiner; and Pesaro, Mario, 3,900,498.

Kuramoto, Yukimasa: *See—*
Fukai, Masakazu; Fujiwara, Shinji; Serizawa, Hiroyuki; Eguchi, Osamaru; Kuramoto, Yukimasa; and Chikamura, Takao, 3,900,882.

Kuraray Co., Ltd.: *See—*
Ohara, Osamu; and Wakabayashi, Nobuyoshi, 3,900,440.
Yamane, Tadayuki; and Hirano, Yutaka, 3,900,549.

Kurasawa, Kazuo: *See—*
Soga, Hiromu; Minamida, Katsuhiro; Kurasawa, Kazuo; and Ii, Masatake, 3,900,887.

Kureha Kagaku Kogyo K.K.: *See—*
Kihara, Sueo, 3,899,798.

Kurtz, Anthony D.; Brosh, Amnon; Gravel, Charles L.; and Mallon, Joseph R., to Kolite Semiconductor Products, Inc. Economical pressure transducer assemblies, methods of fabricating and mounting the same. 3,900,811, Cl. 338-2.000.

Kuwada, Yutaka; Natsugari, Hideaki; and Meguro, Kanji, to Takeda Chemical Industries, Ltd. Antiinflammatory and analgesic oxadiazolo benzodiazocinones. 3,900,490, Cl. 260-307.00A.

Kynaston, David; Tillett, Peter Irving; and Paden, Richard Stephen, to Cambridge Scientific Instruments Limited. Scanning electron-beam instrument. 3,900,734, Cl. 250-311.000.

Kyushu Refractories Co., Ltd.: *See—*
Irie, Sadanao; Tomomoto, Kenichi; Akahori, Toyohiko; and Simomura, Kazuhisa, 3,900,369.

La Cellophane: *See—*
Riboulet, Robert; and Charvet, Eugene, 3,900,653.

Labruyere, Jean Edmond, to Constructions Navales et Industrielles de la Mediterranee (C.N.I.M.). Self-propelled fin stabilized projectiles and launchers therefor. 3,899,953, Cl. 89-1.819.

Laenen, Edward G.: *See—*
Griffiths, Donald E.; Kalthoff, Clement H.; and Laenen, Edward G., 3,900,891.

Lafond, Esther M.: *See—*
Endres, Dan D.; and Lafond, Esther M., 3,900,031.

Lafont, Guy: *See—*
Trouiller, Jean Claude; and Lafont, Guy, 3,900,824.

Lage, David A.; and Senour, Donald A., to BLH Electronics, Inc. Onboard tire strut fault apparatus for aircraft and the like. 3,900,828, Cl. 340-27.00R.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Jourdan-Laforte, Eric, 3,900,555.
Sermanet, Gerard, 3,899,930.

Lalk, Robert H.; Schmidt, Donald L.; and Thomas, Mary R., to Dow Chemical Company, The. Inhibiting the staining of latex paints on wood. 3,900,619, Cl. 427-408.000.

Lalley, John J.; and Lalley, Laurel E. Teaching aid. 3,899,838, Cl. 35-31.00G.

Lalley, Laurel E.: *See—*
Lalley, John J.; and Lalley, Laurel E., 3,899,838.

Lamadrid, Rene G., to Baxter Laboratories, Inc. Blood leak detector. 3,900,396, Cl. 210-94.000.

Lamatsch, Hans: *See—*
Albrecht, Cord; and Lamatsch, Hans, 3,900,702.

Lamb, John N.: *See—*
Chandley, George D.; and Lamb, John N., 3,900,064.

Lambeg Industrial Research Association: *See—*
Robinson, Eric, 3,900,425.

Lambert, Robert R., to Wehr Corporation. Air conduit and diffuser assembly. 3,899,823, Cl. 29-455.000.

Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., to American Petroscience Corporation. Telemetering system for oil wells using reaction modulator. 3,900,827, Cl. 340-18.0NC.

Lamellen und Kupplungsbau GmbH: *See—*
Maucher, Paul, 3,900,091.

Lammers, Uve H. W., to United States of America, Air Force. High speed electronic channel discriminator. 3,900,744, Cl. 307-235.00R.

Lancaster Products Company: *See—*
Woodman, Gerald A.; Uscher, Joseph; and Jacoby, Henry C., 3,900,641.

Lancini, Giancarlo; Lazzari, Ettore; and Diena, Alberto, to Gruppo Lepetit S.p.A. Antibiotic substances. 3,900,567, Cl. 424-319.000.

Lancini, Giancarlo: *See—*
Cricchio, Renato; and Lancini, Giancarlo, 3,900,465.

Landau, Raphael, to Ozalid Company, Ltd. Treatment of synthetic polyester film products. 3,900,324, Cl. 96-87.00R.

Lando, David Jacob, to Western Electric Company, Incorporated. Method of depositing a metal on a surface of a substrate. 3,900,614, Cl. 427-258.000.

Langlois, Roland E.; and Roberson, Cletis L., to Owens-Corning Fiberglas Corporation. Method for producing glass fiber bulk product. 3,900,302, Cl. 65-8.000.

Lanker, Willi, to Turlabor AG. Process and apparatus for prolonging the useful lifetime of a repeatedly charged electrophotographic layer. 3,900,776, Cl. 317-262.00A.

Lanz, Paul: *See—*
Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Franziska, heir; Vogler, Niklaus E., heir; and Vogler, Heinrich, heir, 3,900,464.

Lapierre, Philippe D., to Societe Anonyme dite: Omnium de Prospective Industrielle S.A. Apparatus for the local treatment of yarns, for example the non-continuous dyeing of textile yarns. 3,899,903, Cl. 68-205.00R.

Lappin, Gerald R.: *See—*
Zannucci, Joseph S.; and Lappin, Gerald R., 3,900,442.

Larkin, Robert S.; Lund, Nean K.; and Williams, Charlton E., to Bell Telephone Laboratories, Incorporated. Diversity combination of radar signals. 3,900,874, Cl. 343-16.00R.

Larsen, Larry D.; Schuck, Lee; Pekarek, Joseph C.; and Mott, Richard C., to Honeywell Inc. Installation and test tool for ionization smoke detector. 3,900,795, Cl. 324-158.00R.

Larsen, Raymond B.; and Holmes, Donald E., to LRC, Inc. Matrix printer with overlapping print dots. 3,900,094, Cl. 197-1.00R.

Larson, Harold B. Automatic plant watering apparatus. 3,900,134, Cl. 222-52.000.

Larsson, Bjorn E.: *See—*
Zdanowski, Richard E.; and Larsson, Bjorn E., 3,900,438.

Latimer, Keith Graham: *See—*
Read, Peter John; Latimer, Keith Graham; Reynolds, Terence David Warren; Munson, David, deceased; and Munson, George, administrator, 3,899,820.

Lauber, Leo E.; and Cowden, Ernest A. Orthopedic cast and method of constructing same. 3,900,024, Cl. 128-91.00R.

Laurel Bank Machine Co., Ltd.: *See—*
Uchida, Isamu; Watanabe, Kenkichi; and Sentoku, Hideshi, 3,899,864.

Laurent, Sebastian M.: *See—*
Lee, Thomas E.; and Laurent, Sebastian M., 3,900,415.

Lauterbach, Richard, to Siemens Aktiengesellschaft. Method for coating surfaces of a workpiece by spraying on a coating substance. 3,900,639, Cl. 427-34.000.

Lawrence, John Charles, to F. Bender Limited. Dispensing apparatus. 3,899,975, Cl. 102-63.000.

Layer, Walter J.: *See—*
Korejwa, Alfred; Layer, Walter J.; and Ruda, Richard E., 3,900,545.

Layton, Margaret M.: *See—*
Herczog, Andrew; Layton, Margaret M.; and Rice, Dale W., 3,900,593.

Lazzaretti, Louis G.: *See—*
Giunta, Joseph S.; and Lazzaretti, Louis G., 3,900,065.

Lazzari, Ettore: *See—*
Lancini, Giancarlo; Lazzari, Ettore; and Diena, Alberto, 3,900,567.

Le Bouchage Mecanique: *See—*
Marcel, Henri, 3,900,124.

Leatherman, Alfred F., to Heller, William C., Jr. Self-heating composite bonding means and method. 3,900,360, Cl. 156-272.000.

Lecocq, David E.: *See—*
Franz, Helmut; and Lecocq, David E., 3,900,601.

Lecomte, Claude, to Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H. Systems for anchoring ships at sea. 3,899,990, Cl. 114-230.000.

Ledex, Inc.: *See—*
Hardwick, David R.; and Coors, George T., 3,900,822.

Lednicer, Oliver: *See—*
D'Amato, Salvatore F.; Kimball, John J.; and Lednicer, Oliver, 3,900,219.

Lee, Charles D., Jr.; and Mulligan, William L., to Parks-Cramer Company. Control arrangement for yarn piecing apparatus. 3,899,868, Cl. 57-34.00R.

Lee, George W. Sand removal tool for wells. 3,900,074, Cl. 175-242.000.

Lee-Norse Company: *See—*
Banerjee, Bani R.; Gangal, Mukund D.; and Black, Sigmund, 3,899,893.

Lee, S. Yen, to United States of America, Army. Method of protecting embedded electronic components. 3,900,596, Cl. 427-58.000.

Lee, Thomas E.; and Laurent, Sebastian M., to Ethyl Corporation. Magnetic glass. 3,900,415, Cl. 252-62.510.

Leeds & Northrup Company: *See—*
Bell, Barry A.; and Weiss, Edward L., 3,900,866.

Le Fevre, Robert J.: *See—*
Burke, George K.; Raines, Kenneth; and Le Fevre, Robert J., 3,900,184.

Lehigh Press, Inc., The: *See—*
Girman, Stephen J., 3,900,100.

Lehman, Bruce, to Universal Oil Products Company. Vapor-liquid separation apparatus. 3,900,300, Cl. 55-184.000.

Lehmann, Rolf: *See—*
Christ, Alfred; Tognola, Sergio; and Lehmann, Rolf, 3,899,999.

Lehmann, Walter G., to Polaroid Corporation. Photographic camera and flash lamp selection system. 3,900,860, Cl. 354-126.000.

Leimgruber, Willy; and Weigele, Manfred, to Hoffmann-La Roche Inc. Process for the preparation of aminomethylene malononitrile. 3,900,511, Cl. 260-465.50R.

Leininger, Robert Irvin; Preston, Joseph Ronald; and Lower, Brenton Ray, to Ortho Pharmaceutical Corporation. Dilator for cervical canal. 3,900,033, Cl. 128-344.000.

Leipold, F. Xavier: *See—*
Kluge, Karl-Heinz; and Eppich, Alfred, 3,900,643.

Lekebusch, Ronald C.: *See—*
Freese, Robert W.; Lekebusch, Ronald C.; and Ulcickas, Paul W., 3,900,761.

Lelieveld, Hubertus Leonardus Maria: *See—*
Muys, Gerard Tuynenburg; Lelieveld, Hubertus Leonardus Maria; and van der Hulst, Robert, 3,899,862.

Lemelson, Jerome H. Method of generating monitorable video information from recordings on record members. 3,900,706, Cl. 178-7.200.

Lenhard, Myron James; and Mammino, Joseph, to Xerox Corporation. Imaging process employing treated carrier particles. 3,900,587, Cl. 427-19.000.

Leppek, Heinrich: *See—*
Hoppe, Gerhard; Leppek, Heinrich; Rensmann, Leo; and Kehr, Helmut, 3,900,361.

Lesensky, Leonard: *See—*
Tisdale, Lawrence H.; and Lesensky, Leonard, 3,900,755.

Lesk, Israel A., to Motorola, Inc. Thin low temperature EPI regions by conversion of an amorphous layer. 3,900,345, Cl. 148-1.500.

Lesley, Bascum G., to Deering Milliken Research Corporation. Selvage guide and break-out preventor for knitting machines. 3,899,901, Cl. 66-149.00R.

Leupold & Stevens, Inc.: *See—*
Peterson, Henry O., 3,900,830.

Levelator Corporation: *See—*
Lisbin, Arthur; Ianney, George; and Albanese, James, 3,900,133.

Lever Brothers Company: *See—*
McNaught, John P., 3,900,503.
Muys, Gerard Tuynenburg; Lelieveld, Hubertus Leonardus Maria; and van der Hulst, Robert, 3,899,862.

Levine, Irving E., to Chevron Research Company. Methoxymethane sterilization method. 3,900,288, Cl. 21-58.000.

Levins, Dave Baer: *See—*
Johnston, Richard Paul; and Levins, Dave Baer, 3,900,274.

Lewinter, Sidney W., to Singer Company, The. Electronic countermeasures system. 3,900,879, Cl. 343-113.00R.

Lewis, Geoffrey Arthur, to Lucas Aerospace Limited. Mechanical linkage. 3,899,936, Cl. 74-479.000.

Lewis, James A.: *See*—
Burtch, Kurt A.; and Lewis, James A., 3,900,142.

Lewis, William James: *See*—
Calder, Peter Henry; Gupta, Prem Chandra; and Lewis, William James, 3,900,177.

Ley, Kurt: *See*—
Seng, Florin; Ley, Kurt; and Metzger, Georg, 3,900,562.

Liautaud, Jean A., to Subsea Equipment Associates Limited. Apparatus for connection between submarine conduits. 3,899,894, Cl. 61-72.300.

Libbey-Owens-Ford Company: *See*—
Mattimoe, Paul T.; Motter, Theodore J.; Hofmann, John J.; and Herliczek, Siegfried H., 3,900,673.

Licentia Patent-Verwaltungs-G.m.b.H.: *See*—
Beerwerth, Wolfgang; Geppert, Albrecht; and Schimmer, Rigobert, 3,900,153.
Fleischer, Wolfgang; and Knuth, Kurt, 3,900,880.

Liendl, Johann: *See*—
Penczynksi, Peter; Matthaus, Gunther; Massek, Peter; and Liendl, Johann, 3,900,699.

Liggett & Myers Incorporated: *See*—
Kallianos, Andrew G.; Warfield, Albert H.; and Simpson, Melvyn I., 3,900,521.

Lileev, Valerian Petrovich: *See*—
Zabotin, Alexandr Alexandrovich; Onikov, Eduard Arshakovich; Galperin, Alexandr Lvovich; Loschilin, Evgeny Dmitrievich; Lileev, Valerian Petrovich; German, Roman Anatolievich; Rutkevich, Zinovy Yakovlevich; and Sakharov, Boris Alexandrovich, 3,900,049.

Limbach, Anthony Paul: *See*—
Johnson, Keith G.; and Limbach, Anthony Paul, 3,900,544.

Linatex Corporation of America: *See*—
Stewart, William E., 3,900,628.

Lindaco Ltd.: *See*—
Astero, Jan-Erik, 3,900,253.

Lindblad, Nero R.; Johnson, Gordon E.; and Sharp, James H., to Xerox Corporation. Electrostatographic imaging process. 3,900,589, Cl. 427-19.000.

Lipnick, Richard: *See*—
Gibbon, John; Heacock, Burt; Lipnick, Richard; Strenkowski, John; and Tutino, Matthew, 3,900,846.

Lippert, Hans Joachim: *See*—
Kocks, Friedrich; and Lippert, Hans Joachim, 3,900,067.

Lippman, Alfred: *See*—
Terry, John Christopher; Lippman, Alfred; Sebenik, Roger Frank; and Harris, Harry Gordon, Jr., 3,900,312.

Lipsky, Milton H.: *See*—
Welch, Dennis W.; and Lipsky, Milton H., 3,900,035.

Lisbin, Arthur; Ianney, George; and Albanese, James, to Levelator Corporation. Plate separator for self-leveling plate dispensing. 3,900,133, Cl. 221-280.000.

Liston, Max D., to Abbott Laboratories. Apparatus and method for filling a compartment. 3,900,289, Cl. 23-230.00R.

Littell, Ruddy: *See*—
Allen, George Rodger, Jr.; McEvoy, Francis Joseph; DeVries, Vern Gordon; Moran, Daniel Bryan; and Littell, Ruddy, 3,900,495.
Allen, George Rodger, Jr.; McEvoy, Francis Joseph; De Vries, Vern Gordon; Moran, Daniel Bryan; and Littell, Ruddy, 3,900,563.

Litton Systems, Inc.: *See*—
Costales, John E., 3,900,732.

Ljubushkin, Georgy Vasilievich: *See*—
Tjutjunnikov, Anatoly Borisovich; Tjutjunnikov, Boris Nikanorovich; Marchenko, Alexandr Nikolaevich; Burin, Viktor Leontievich; Bolotin, Josif Mironovich; Drozdov, Anatoly Sergeevich; Koval, Leonid Petrovich; Didenko, Zoya Vasilievna; Ljubushkin, Georgy Vasilievich; Budnik, Jury Mikhailovich; Moskvin, Vladimir Dmitrievich; and Bolyanovsky, Dmitry Mikhailovich, 3,900,537.

Lock, Chuck. Electronic acupuncture device. 3,900,020, Cl. 128-2.10C.

Lockheed Electronics Co., Inc.: *See*—
Gibbon, John; Heacock, Burt; Lipnick, Richard; Strenkowski, John; and Tutino, Matthew, 3,900,846.

Lockheed Missiles & Space Company, Inc.: *See*—
McKay, Russell M., Sr., 3,900,738.

Lofgren, Nils Clov Allan: *See*—
Sjoberg, Borje Gustav; Odman, Rolf Ragnar; Belstad, Arne; and Lofgren, Nils Clov Allan, 3,900,293.

Logiadis, Barbara Ann. Urine sampling device and method. 3,900,019, Cl. 128-2.00F.

Lohr, Thomas E.; and Sack, John J., to Allied Chemical Corporation. Energy absorption arrangement in vehicle passenger restraint system. 3,900,210, Cl. 280-150.0AB.

Long, Alan Gibson: *See*—
Underwood, William George Elphinstone; and Long, Alan Gibson, 3,900,487.

Long, Lennart Ernst, to United States of America, Transportation. Airport loop detector system. 3,900,829, Cl. 340-38.00L.

Loomans, Bernard A., to Baker Perkins, Inc. Continuous mixing and/or kneading machine with co-wiping single lead screws. 3,900,187, Cl. 259-192.000.

Lorenzetti, James J.; and Cordea, James N., to Armco Steel Corporation. Cold-drawn, straightened and stress relieved steel wire for prestressed concrete and method for production thereof. 3,900,347, Cl. 148-12.00B.

Loschilin, Evgeny Dmitrievich: *See*—
Zabotin, Alexandr Alexandrovich; Onikov, Eduard Arshakovich; Galperin, Alexandr Lvovich; Loschilin, Evgeny Dmitrievich; Lileev, Valerian Petrovich; German, Roman Anatolievich; Rutkevich, Zinovy Yakovlevich; and Sakharov, Boris Alexandrovich, 3,900,049.

Loshbough, Richard C.: *See*—
Williams, Roger B., Jr.; Loshbough, Richard C.; and Cherry, Richard A., 3,899,915.

Lovendahl, Norman H. Slotting cutter apparatus. 3,899,813, Cl. 29-105.00R.

Lovida AG: *See*—
Wyler, Eugen; and Buser, Max, 3,900,125.

Lowden, Robert P.: *See*—
Kraft, Wayne R.; and Lowden, Robert P., 3,900,746.

Lower, Brenton Ray: *See*—
Leininger, Robert Irvin; Preston, Joseph Ronald; and Lower, Brenton Ray, 3,900,033.

LRC, Inc.: *See*—
Larsen, Raymond B.; and Holmes, Donald E., 3,900,094.

Lubbock, Frederick John; and Polgar, Livia, to Dulux Australia Ltd. Novel autoxidisable liquids. 3,900,336, Cl. 106-252.000.

Lucas Aerospace Limited: *See*—
Collins, Keith Douglas, 3,900,017.
Lewis, Geoffrey Arthur, 3,899,936.

Lucas Electrical Company Limited: *See*—
Mainprize, David, 3,900,015.

Luethi, Christian; Biland, Hans Rudolf; and Duennenberger, Max, to Ciba-Geigy Corporation. Triazine derivatives. 3,900,443, Cl. 260-45.8NT.

Luke, John Anthony: *See*—
Horsewell, Henry George; and Luke, John Anthony, 3,900,037.

Lund, Nean K.: *See*—
Larkin, Robert S.; Lund, Nean K.; and Williams, Charlton E., 3,900,874.

Luossavaara-Kiirumavaara AB.: *See*—
Sjoberg, Borje Gustav; Odman, Rolf Ragnar; Belstad, Arne; and Lofgren, Nils Clov Allan, 3,900,293.

Luther, Hans Werner; Romer, Rudolf; Winkelmann, Jurgen; and Rossmann, Winfried, to Rheinmetall GmbH. Fin-stabilized subcaliber projectile. 3,899,978, Cl. 102-93.000.

Lyftgot, Dennis L.: *See*—
Bruschtein, Fabio B.; and Lyftgot, Dennis L., 3,900,434.

Lynch, Thomas H.; and Patten, Hudson T., III, to Bunker-Ramo Corporation, The. Apparatus and method for measuring speed of sound in liquid. 3,900,839, Cl. 340-203.000.

Lyon, John Keith: *See*—
Kuehn, Donald E.; and Lyon, John Keith, 3,900,132.

Lyon, Richard K., to Exxon Research and Engineering Company. Method for the reduction of the concentration of NO in combustion effluents using ammonia. 3,900,554, Cl. 423-235.000.

MacBean, Donald George, to JWI Ltd. Woven cloth seam. 3,900,659, Cl. 428-223.000.

Machlett Laboratories, Inc., The: *See*—
Holland, William P.; Azud, Robert E.; and Koller, Thomas J., 3,900,751.

Mackenzie, John D., to University of California, The Regents of the. Method of making glass products. 3,900,303, Cl. 65-18.000.

MacLeish, William T.; and Milligan, Terry W., to Polaroid Corporation. Photographic element comprising an opaque backcoat. 3,900,323, Cl. 96-84.00R.

Maddox, James P., to Rockwell International Corporation. Thermal bed screen pack. 3,899,815, Cl. 29-163.50R.

Maeda Industries, Ltd.: *See*—
Ozaki, Nobuo, 3,900,088.

Maeda, Toru: *See*—
Shimada, Kazushi; Maeda, Toru; Nishizawa, Tamotu; Narisada, Takehiko; Anzai, Hisao; and Sasaki, Yositaka, 3,900,453.

Maeda, Youji: *See*—
Hamada, Michihiro; Maeda, Youji; and Inoue, Shinichi, 3,900,807.

Magdo, Ingrid E., to International Business Machines Corporation. Novel integratable Schottky barrier structure and method for the fabrication thereof. 3,900,344, Cl. 148-1.500.

Magdziarz, Raymond J.: *See*—
Bart, Stanley; and Magdziarz, Raymond J., 3,900,765.

Magnetic Analysis Corporation: *See*—
Mansson, Sven E., 3,900,793.

Magnuson, Roland A.: *See*—
Jayne, Laurence I.; and Magnuson, Roland A., 3,899,954.

Maheux, Peter Francis; and Deacon, Brian Matthew, to Northern Electric Company Limited. Electrical connection of flexible printed circuits. 3,900,242, Cl. 339-95.00R.

Mai, Gerhard; Siepmann, Reiner; and Kummer, Franz, to W. C. Heraeus GmbH. Catalyst for the reduction of nitric oxides. 3,900,428, Cl. 252-462.000.

Maier, Clarence C.: *See*—
Parsons, William F.; Blair, Gerald E.; and Maier, Clarence C., 3,900,328.

Maillet, Rene Louis. Frames for spectacles. 3,899,840, Cl. 351-113.000.

Mainprize, David, to Lucas Electrical Company Limited. Spark ignition systems for internal combustion engines. 3,900,015, Cl. 123-148.00E.

Makepeace, Anthony Peter Walter; and Griffith, Huw Bevan. Coupling for endoscopes and instruments particularly cameras. 3,900,021, Cl. 128-4.000.

Makipirtti, Simo A.: *See—*
Kaasila, Kauko Johannes; Toivanen, Toivo Adrian; Harkki, Seppo Untamo; Neimela, Toivo Isak; Makipirtti, Simo A.; Malmstrom, Rolf E.; Tuominen, Tapio Kalevi; Aaltonen, Olavi August; and Noponen, Veikko H., 3,900,310.

Makishima, Hiroshi; Shinohara, Toshio; Kawahara, Yukio; Nii, Hiroshi; and Ebine, Setsuo, to Dai Nippon Toryo Co., Ltd. Decorative article having inorganic coating film having rugged pattern including cracks and process for production thereof. 3,900,630, Cl. 428-155.000.

Makurin, Pavel Semenovich: *See—*
Privalov, Petr Leonidovich; Makurin, Pavel Semenovich; Plotnikov, Valerian Valerievich; Koryagin, Vladimir Vasilievich; Polpudnikov, Viktor Sergeevich; and Stepanjuk, Georgy Pavlovich, 3,899,918.

Malec, Robert E., to Ethyl Corporation. Lubricating oil compositions containing trialkyl-substituted phenols and benzotriazole. 3,900,410, Cl. 252-51.50R.

Malley, Arthur: *See—*
Wilson, Billie J.; and Malley, Arthur, 3,900,461.

Mallon, Joseph R.: *See—*
Kurtz, Anthony D.; Brosh, Amnon; Gravel, Charles L.; and Mallon, Joseph R., 3,900,811.

Malmin, Oscar. Endodontic sealing system and apparatus. 3,899,830, Cl. 32-15.000.

Malmstrom, Rolf E.: *See—*
Kaasila, Kauko Johannes; Toivanen, Toivo Adrian; Harkki, Seppo Untamo; Neimela, Toivo Isak; Makipirtti, Simo A.; Malmstrom, Rolf E.; Tuominen, Tapio Kalevi; Aaltonen, Olavi August; and Noponen, Veikko H., 3,900,310.

Maltz, Martin Sidney, to Xerox Corporation. High voltage amplifier. 3,900,800, Cl. 330-15.000.

Mamin, Alexandr Ilich: *See—*
Somov, Boris Stepanovich; Mamin, Alexandr Ilich; Novikov, Andrei Porfirievich; Filippov, Vyacheslav Ivanovich; Khirdzhiev, Sergei Grigorievich; Gurevich, Vladimir Zakharovich; Voronov, Nikolai Stefanovich; and Agafonov, Ivan Fedorovich, 3,899,908.

Mammino, Joseph: *See—*
Lenhard, Myron James; and Mammino, Joseph, 3,900,587.

Mandell, Harry Creston, Jr., to Pennwalt Corporation. Temporary soil release resins applied to fabrics by spraying. 3,900,606, Cl. 427-155.000.

Mansei Kogyo Kabushiki Kaisha: *See—*
Moriya, Nobuyoshi, 3,900,768.

Mansson, Sven E., to Magnetic Analysis Corporation. Eddy current testing apparatus including a rotating head with probe and null circuit means mounted thereon including rotary transformer windings. 3,900,793, Cl. 324-40.000.

Marathon Oil Company: *See—*
Kersch, Keith M.; Pouska, George A.; Drayer, Dennis E.; and Tackett, James E., Jr., 3,900,041.
Merrill, La Vaun S., Jr.; Drayer, Dennis E.; Gogarty, William B.; and Pouska, George A., 3,900,391.

Marcel, Henri, to Le Bouchage Mecanique. Molded synthetic material stoppers. 3,900,124, Cl. 215-291.000.

Marchenko, Alexandr Nikolaevich: *See—*
Tjutjunnikov, Anatoly Borisovich; Tjutjunnikov, Boris Nikanorovich; Marchenko, Alexandr Nikolaevich; Burin, Viktor Leontievich; Bolotin, Josif Mironovich; Drozdov, Anatoly Sergeevich; Koval, Leonid Petrovich; Didenko, Zoya Vasilievna; Ljubushkin, Georgy Vasilievich; Budnik, Jury Mikhailovich; Moskvin, Vladimir Dmitrievich; and Bolyanovsky, Dmitry Mikhailovich, 3,900,537.

Marconi Company Limited, The: *See—*
Baxter, Ivor Renton, 3,900,262.

Marcucci, Rudoph, to GTE Sylvania Incorporated. Method of making arch shaped arc tube. 3,900,237, Cl. 316-20.000.

Marcus, Sanford Morton; and Patterson, Frank Knowles, to du Pont de Nemours, E. I., and Company. Varistor compositions. 3,900,432, Cl. 252-519.000.

Markley, Lowell D., to Dow Chemical Company, The. Substituted butyl esters of alkyl- and haloalkyl-sulfonic acids. 3,900,509, Cl. 260-456.00R.

Markofsky, Sheldon B., to W. R. Grace & Co. Process for breaking emulsions. 3,900,423, Cl. 252-344.000.

Marks, Alvin M. Method and apparatus for forming submicron dipole particles. 3,900,417, Cl. 252-300.000.

Marriott, Carroll L.; Patzer, Hans E.; Hall, Ronald D.; Caposell, Charles D.; and Klein, Aaron David, to United States of America, Navy. High strength aluminum interconnections for microelectronics packaging. 3,900,353, Cl. 156-3.000.

Marrs, Oren L.; and Mozer, Larry P., to Phillips Petroleum Company. Method of coating a polyolefin surface and the coated article. 3,900,691, Cl. 428-451.000.

Marsing, Helmut: *See—*
Kullmann, Dieter; and Marsing, Helmut, 3,900,809.

Martel, Jacques; and Heymes, Rene, to Roussel UCLAF. Cephalosporan derivatives and their preparation. 3,900,468, Cl. 260-243.00C.

Martin, Hubert. Process for producing die-casting alloys from aluminum scrap. 3,900,313, Cl. 75-68.00R.

Martin, William F. Ash collector. 3,900,154, Cl. 229-1.50R.

Marwede, Gunter: *See—*
Dietrich, Manfred; Schnetger, Jochen; Haas, Friedrich; Marwede, Gunter; and Appel, Hansgunter, 3,900,532.

Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Glass fiber reinforced elastomers. 3,900,679, Cl. 428-378.000.

Maschinenfabrik Fr. Niepmann & Co.: *See—*
Niepmann, Otto, 3,899,946.

Maschinenfabrik Goebel, GmbH: *See—*
Jakob, Hans, 3,899,948.

Mason, David Robert; Cole, Susan Margaret; Cayless, Maurice Arthur; and Wharmby, David Osborn, to Thorn Lighting Limited. Electric discharge lamp. 3,900,754, Cl. 313-221.000.

Massachusetts Machine Shop Inc.: *See—*
Smith, Peter S.; and Theurer, Richard B., 3,900,729.

Massek, Peter: *See—*
Penczynksi, Peter; Matthaus, Gunther; Massek, Peter; and Liendl, Johann, 3,900,699.

Massie, Stephen N., to Universal Oil Products Company. Process for the cyclialkylation of amines. 3,900,479, Cl. 260-293.640.

Masters, George, to Beauty Masters, Ltd. Method of preparing and placing artificial eyelashes. 3,900,038, Cl. 132-5.000.

Masuda, Noboru; and Takiguchi, Hisashi, to Denki Onkyo Company, Ltd. Galvano-magnetro effect device. 3,900,813, Cl. 338-32.00R.

Masuda, Noboru, to Denki Onkyo Company, Ltd. Revolution sensing apparatus. 3,900,814, Cl. 338-32.00R.

Masuda, Taizo: *See—*
Yokota, Hiroomi; and Masuda, Taizo, 3,899,892.

Masuda, Yoshikazu; and Inagaki, Tatsumi, to Sun Spice Co., Ltd. Low-temperature-pulverized animal foods. 3,900,579, Cl. 426-388.000.

Matherne, Carrol J. Tubing testing tool. 3,899,920, Cl. 73-40.50R.

Mathews, Carl Fraser; Nield, Eric; Rose, John Brewster; and Vincent, Peter Incledon, to Imperial Chemical Industries Limited. Graft of acrylonitrile, N-aryl maleimide and alkene unto a diene substrate. 3,900,531, Cl. 260-878.00R.

Matsubara, Kiyoshi, to Agency of Industrial Science & Technology. Method for control of ionization electrostatic plating. 3,900,585, Cl. 427-13.000.

Matsuda, Yoshindo: *See—*
Terajima, Kazuki; Tomita, Shigeru; Matsuda, Yoshindo; and Abe, Keiji, 3,900,422.

Matsukawa, Hiroharu: *See—*
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Hayashi, Takao; Matsukawa, Hiroharu; and Ishige, Sadao, 3,900,217.
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Matsushita Electric Industrial Co., Ltd.: *See—*
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Hasegawa, Nobuo; Yamashita, Toshio; and Kitamura, Saburo, 3,900,883.
Iijima, Yasuo, 3,900,774.
Kawabata, Hidetsugu; Yamashita, Toshio; Uda, Hiroshi; Yoshida, Manabu; and Kitamura, Saburo, 3,900,716.
Morimoto, Toshio; and Fukunaga, Yoshiaki, 3,900,174.
Oku, Takeshi; and Tanaka, Masaru, 3,900,745.
Sugaya, Hiroshi; and Hosono, Hiroo, 3,900,892.
Takashima, Kazushige; Nishigaki, Katumi; and Yamashita, Terumasa, 3,900,775.

Matsushita, Shigeo: *See—*
Kimura, Masakazu; Nanamatsu, Satoshi; Doi, Kikuo; and Matsushita, Shigeo, 3,900,246.

Matsuzaki, Tetsuo: *See—*
Sumi, Hirotaka; Suzuki, Isao; Yokoe, Isamu; and Matsuzaki, Tetsuo, 3,900,777.

Matthaus, Gunther: *See—*
Penczynksi, Peter; Matthaus, Gunther; Massek, Peter; and Liendl, Johann, 3,900,699.

Mattimoe, Paul T.; Motter, Theodore J.; Hofmann, John J.; and Herliczek, Siegfried H., to Libbey-Owens-Ford Company. Automotive glazing structure. 3,900,673, Cl. 428-339.000.

Maucher, Paul, to Lamellen und Kupplungsbau GmbH. Clutch release. 3,900,091, Cl. 192-98.000.

Maus, Fritz: *See—*
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Platz, Stephan; Friedsam, Josef; Schweicher, Wolfgang; Behr, Rolf; Wasser, Willi; and Browatzki, Kurt, 3,900,326.

Maximovich, Boleslav Ivanovich: *See—*
Paton, Boris Evgenievich; Gusev, Vladimir Alexeevich; Dudko, Daniil Andreevich; Maximovich, Boleslav Ivanovich; and Asoyants, Grigory Bagradovich, 3,900,149.

Mayeda, Akira: *See—*
Hirose, Kunio; and Mayeda, Akira, 3,900,893.

McArdle, Meade. Multipurpose impact hand tool. 3,900,058, Cl. 145-50.00R.

McBride, Ralph J. Support and exciter device. 3,900,023, Cl. 128-36.000.

McCann, Mary Conlin; Plummer, William T.; and Walworth, Vivian K., to Polaroid Corporation. Camera to microscope adaptor with a special optical element. 3,900,858, Cl. 354-79.000.

McCarron, John C.: *See—*
Wiesler, Mordechai; and McCarron, John C., 3,900,244.

McCloskey, Albert R., to Rockwell International Corporation. Method of manufacturing spherical bearings. 3,900,294, Cl. 29-149.50B.
McClung, Charles E.; and Glasgow, David G., to Monsanto Company. Polyurethane interlayer for laminated safety glass. 3,900,446, Cl. 260-75.0NT.
McCombs, Frank Paul, to Owens-Corning Fiberglas Corporation. Glass fiber reinforced elastomers. 3,900,661, Cl. 428-250.000.
McCulloch Corporation: *See—*
Dilworth, John Lewis, 3,900,276.
McDevitt, Bernard J., to Sperry Rand Corporation. Print media identification code. 3,899,968, Cl. 101-111.000.
McDonnell, Tomas Paul. Combination golf caddie car and golf bag. 3,900,209, Cl. 280-36.00C.
McEvoy, Francis Joseph: *See—*
Allen, George Rodger, Jr.; McEvoy, Francis Joseph; DeVries, Vern Gordon; Moran, Daniel Bryan; and Littell, Ruddy, 3,900,495.
Allen, George Rodger, Jr.; McEvoy, Francis Joseph; De Vries, Vern Gordon; Moran, Daniel Bryan; and Littell, Ruddy, 3,900,563.
McGee, John W.: *See—*
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McGeogh, James E.: *See—*
Jensen, Garold K.; and McGeogh, James E., 3,900,871.
Jensen, Garold K.; and McGeogh, James E., 3,900,872.
McGonagle, Hugh K. Golf swing training brace. 3,900,199, Cl. 273-189.00A.
McIntosh, Kenneth W.: *See—*
Herman, Eugene T.; and McIntosh, Kenneth W., 3,900,280.
McIver, George W.; and Buie, James L., to TRW Inc. Asynchronous binary multiplier using non-threshold logic. 3,900,724, Cl. 235-164.000.
McKay, Russell M., Sr., to Lockheed Missiles & Space Company, Inc. Non-contact measuring gauge. 3,900,738, Cl. 250-560.000.
McKenna, John F., Jr.: *See—*
United States of America, National Aeronautics and Space Administration; Daly, William M.; and McKenna, John F., Jr., 3,900,741.
McKenna, Lawrence W., Jr., to Monsanto Company. Process of making a pressure sensitive adhesive article. 3,900,610, Cl. 427-207.000.
McKinley, Suzanne V.: *See—*
Mitchell, Albertha B.; McKinley, Suzanne V.; and Rakshys, Joseph W., Jr., 3,900,451.
McMillan, William J., to Dow Chemical Company, The. Indented sheet. 3,899,805, Cl. 24-213.00B.
McNaught, John P., to Lever Brothers Company. Randomly interesterified sunflower and tobaccoseed oils. 3,900,503, Cl. 260-410.700.
McNeil Laboratories, Incorporated: *See—*
Rasmussen, Chris Royce, 3,900,470.
McPhee, Charles J., to American Hospital Supply Corporation. Injection site for sterile medical liquid container. 3,900,028, Cl. 128-272.000.
McPhee, John L., to Aluminum Plumbing Fixture Corporation. Supersafe towel hook. 3,900,180, Cl. 248-288.000.
Meader, Arthur L., Jr.; and Runyon, William L., Jr., to Chevron Research Company. Process for coating a surface and the coated surface. 3,900,687, Cl. 428-425.000.
Meadus, Frederick W.; Sparks, Bryan D.; and Puddington, Ira E., to Canadian Patents and Development Limited. Fe-Sn-Cu-Pb sintered composite metal article and process. 3,900,317, Cl. 75-211.000.
Mears, William E., to Sperry Rand Corporation. Synchronous pulse digital filter. 3,900,848, Cl. 343-7.300.
Meguro, Kanji: *See—*
Kuwada, Yutaka; Natsugari, Hideaki; and Meguro, Kanji, 3,900,490.
Meininger, Fritz: *See—*
Fuchs, Hermann; and Meininger, Fritz, 3,900,510.
Meisters, Aivars: *See—*
Mole, Thomas; and Meisters, Aivars, 3,900,505.
Melnick, Irving; and Oakes, George W., to Melnick, Irving. Closed surgical evacuator. 3,900,029, Cl. 128-278.000.
Memorex Corporation: *See—*
Tanck, Elinor J.; Hulse, Lauren L.; and Kelly, Paul P., 3,900,414.
Menendez, Jaime Torroja, to Sener, Tecnica Industrial y Naval, S.A. Ships equipped with pressurized cargo tanks supported on continuous shells. 3,899,988, Cl. 114-74.00A.
Menzel, Gerhard: *See—*
Muller, Karl-Adolf; Gude, Armin; and Menzel, Gerhard, 3,900,607.
Mercer, Francis T.: *See—*
Bartlett, Fred J.; Bevis, Paul A.; Hoyt, Hazen L., III; and Mercer, Francis T., 3,900,405.
Mercer, Nelson M., Jr., to Ford Motor Company. Double lever strain multiplier apparatus and method. 3,899,922, Cl. 73-88.50R.
Merlen, Monty M.; and Nichols, Peter H., to Intec Corporation. Laser scanner flaw detection system. 3,900,265, Cl. 356-200.000.
Merrill, La Vaun S , Jr.; Drayer, Dennis E.; Gogarty, William B.; and Pouska, George A., to Marathon Oil Company. Method of making a pumpable slurry from waxy crude oil. 3,900,391, Cl. 208-370.000.
Messerschmitt-Boelkow-Blohm G.m.b.H.: *See—*
Morawski, Wilhelm; and Raeithel, Heinrich, 3,900,739.
Metcalfe, Kenneth A.; and Clements, Alwin S., to Commonwealth of Australia, The. Reactive developer for electrophotography. 3,900,413, Cl. 252-62.100.
Metzger, Georg: *See—*
Seng, Florin; Ley, Kurt; and Metzger, Georg, 3,900,562.
Metzler, John C.: *See—*
Bayles, Francis Derrick; Dudley, Michael Alan; and Metzler, John C., 3,900,701.
Meyer, Arnfried. Dewatering apparatus. 3,899,835, Cl. 34-58.000.
Mich, Peter R.: *See—*
Calabro, Salvatore R.; Calabro, John A.; and Mich, Peter R., 3,900,842.
Michaels, James. Fuel for engines. 3,900,297, Cl. 44-57.000.
Michail, Michel S.; Woodard, Ollie C.; and Yourke, Hannon S., to International Business Machines Corporation. Method and apparatus for positioning a beam of charged particles. 3,900,736, Cl. 250-492.00A.
Michel, Marcel. Binding strip for book leaves. 3,900,642, Cl. 428-40.000.
Michel, Rudolph Henry: *See—*
Ikeda, Richard Masayoshi; and Michel, Rudolph Henry, 3,900,670.
Micro Devices Corporation: *See—*
Plasko, Emil Robert, 3,900,713.
Micro-Gen Equipment Corporation: *See—*
Parke, James G.; and Gerlach, C. Richard, 3,900,165.
Midland-Ross Corporation: *See—*
Durling, Harold, 3,900,230.
Pavlot, James, 3,900,269.
Swanson, Kenneth B.; and Huffman, Herman M., 3,899,889.
Swanson, Kenneth B., 3,900,840.
Mikeladze, Vitaly Georgievich: *See—*
Tupolev, Andrei Nikolaevich; Tupolev, Alexei Andreevich; Minkner, Kurt Vladimirovich; Bonin, Alexandr Romanovich; Cheremukhin, Georgy Alexeevich; Bliznjuk, Valentin Ivanovich; Pukhov, Alexandr Leonidovich; Svischev, Georgy Petrovich; Bjushgens, Georgy Sergeevich; Nikolaev, Alexandr Vasilievich; and Mikeladze, Vitaly Georgievich, 3,900,178.
Miles Laboratories, Inc.: *See—*
Buckler, Robert Thomas; Hartzler, Harold Eugene; Hayao, Shin; and Nichols, Gust, 3,900,492.
Schulz, Arthur August, 3,900,576.
Miley, Frank P.: *See—*
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Milgrom, Jack, to General Tire & Rubber Company, The. Hydroxyl or thiol terminated telomeric ethers. 3,900,518, Cl. 260-573.000.
Miller, George T., to Hooker Chemicals & Plastics Corporation. Flame retardant cellulosic materials. 3,900,327, Cl. 106-15.0FP.
Miller, George T., to Hooker Chemicals & Plastics Corporation. Flame proofing of fabrics. 3,900,664, Cl. 428-269.000.
Miller, Jacob I.: *See—*
Natarelli, Gerard E., Jr.; Pinto, Frank G.; and Miller, Jacob I., 3,900,535.
Miller, John H., III: *See—*
Girdner, William I.; and Miller, John H., III, 3,900,895.
Miller, Lewis S. Electrostatographic copy paper containing glycidyl quaternary ammonium compounds. 3,900,319, Cl. 96-1.800.
Milligan, Terry W.: *See—*
MacLeish, William T.; and Milligan, Terry W., 3,900,323.
Milling, Robert W., to United States of America, Air Force. Two stage gas dynamic laser. 3,900,802, Cl. 331-94.50G.
Mimken, Frederick J., to General Dynamics Corporation. Digital range computer systems for air navigation systems such as tacan. 3,900,797, Cl. 328-129.000.
Minahara, Kazumi: *See—*
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Minamida, Katsuhiro: *See—*
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Minkner, Kurt Vladimirovich: *See—*
Tupolev, Andrei Nikolaevich; Tupolev, Alexei Andreevich; Minkner, Kurt Vladimirovich; Bonin, Alexandr Romanovich; Cheremukhin, Georgy Alexeevich; Bliznjuk, Valentin Ivanovich; Pukhov, Alexandr Leonidovich; Svischev, Georgy Petrovich; Bjushgens, Georgy Sergeevich; Nikolaev, Alexandr Vasilievich; and Mikeladze, Vitaly Georgievich, 3,900,178.
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Kline, Robert J., 3,900,591.
Phillips, Robert E., 3,900,138.
Taylor, Allen L., 3,899,969.
Minolta Camera Kabushiki Kaisha: *See—*
Tsujimoto, Kayoshi, 3,900,857.
Mitchell, Albertha B.; McKinley, Suzanne V.; and Rakshys, Joseph W., Jr., to Dow Chemical Company, The. Method of making sulfhydryl-containing polymers. 3,900,451, Cl. 260-79.5NV.
MITEC Moderne Industrietechnik GmbH: *See—*
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Mitsubishi Rayon Co., Ltd.: *See—*
Ono, Michakaze; Sahara, Hajime; and Akasaka, Masonori, 3,900,285.
Shimada, Kazushi; Maeda, Toru; Nishizawa, Tamotu; Narisada, Takehiko; Anzai, Hisao; and Sasaki, Yositaka, 3,900,453.
Mitsui Mining & Smelting Co., Ltd.: *See—*
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Miwa, Kiyoshi: *See*—
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Miyamatsu, Hiroki: *See*—
Suzuki, Tadayuki; Wada, Jin; Miyamatsu, Hiroki; Ueno, Shinji; and Shimizu, Mitsuhiro, 3,900,486.
Miyamoto, Akio; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Desensitizer composition. 3,900,218, Cl. 282-27.500.
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Inoue, Shohei; Kanbe, Masaki; Takada, Tadamichi; Miyazaki, Nobuyuki; and Yokokawa, Masanori, 3,900,424.
Mladenovich, Tomislav: *See*—
Dietze, Wolfgang; Schnoller, Manfred; Mladenovich, Tomislav; and Baumgartner, Werner, 3,900,039.
Mobil Oil Corporation: *See*—
Andress, Harry J., Jr.; and Ashjian, Henry, 3,900,411.
Schard, Malcolm P., 3,900,534.
Mochizuki, Mitsuo. Framing element and its supporting device for laying interior boarding on foundation structure. 3,899,857, Cl. 52-126.000.
Mockli, Peter: *See*—
Zographos, Georgeos; and Mockli, Peter, 3,900,318.
Mocny, Richard C.; and Mueller, Francis B., to Waco Scaffold & Shoring Co. Column roll out support. 3,900,179, Cl. 248-287.000.
Moderna Butiksinredningar AB: *See*—
Johnsson, Berndt-Ola Folke, 3,900,243.
Moens, Joris, to N.V. Bekaert S.A. Reinforcing wire element and materials reinforced therewith. 3,900,667, Cl. 428-292.000.
Mole, Thomas; and Meisters, Aivars, to Commonwealth Scientific and Industrial Research Organization. Catalysed reaction of aluminum compounds with nitriles. 3,900,505, Cl. 260-448.00A.
Molitorisz, Joseph. Rotary hay-briqueting machine for compacting fibrous material. 3,899,964, Cl. 100-89.000.
Molls, Hans Heinz: *See*—
Hildebrand, Dietrich; Kruckenberg, Winfried; Kuhnel, Werner; Molls, Hans Heinz; and Wolf, Karlheinz, 3,900,283.
Moltgen, Gottfried, to Siemens Aktiengesellschaft. Method and apparatus for generating reactive power. 3,900,792, Cl. 323-102.000.
Monks, Joseph R.: *See*—
Grubb, Everett F.; Hagedorn, Erwin C.; and Monks, Joseph R., 3,900,329.
Monsanto Company: *See*—
Beer, Ludwig A., 3,900,528.
Beer, Ludwig A., 3,900,529.
Chupp, John Paul, 3,900,484.
King, Henry L.; and McGee, John W., 3,900,527.
McClung, Charles E.; and Glasgow, David G., 3,900,446.
McKenna, Lawrence W., Jr., 3,900,610.
Sincock, Thomas F., 3,900,120.
Montecatini Edison S.p.A.: *See*—
Valvassori, Alberto; Sartori, Guido; and Turba, Vittorio, 3,900,452.
Monti, Anthony, to SuCrest Corporation. Direct compression vehicle. 3,900,569, Cl. 424-361.000.
Moore, Carl, to Dow Chemical Company, The. Process for coating a nonporous substrate with a vinylidene chloride polymer using a thermoplastic polyurethane precoat. 3,900,616, Cl. 427-385.000.
Moran, Daniel Bryan: *See*—
Allen, George Rodger, Jr.; McEvoy, Francis Joseph; DeVries, Vern Gordon; Moran, Daniel Bryan; and Littell, Ruddy, 3,900,495.
Allen, George Rodger, Jr.; McEvoy, Francis Joseph; De Vries, Vern Gordon; Moran, Daniel Bryan; and Littell, Ruddy, 3,900,563.
Morawski, Wilhelm; and Raeithel, Heinrich, to Messerschmitt-Boelkow-Blohm G.m.b.H. Device for providing a current supply to inductive loads by use of a battery and a d. c. pulse transformer positioned between battery and load. 3,900,739, Cl. 307-41.000.
Moreschini, Paolo: *See*—
Fattore, Vittorio; Moreschini, Paolo; and Notari, Bruno, 3,900,426.
Morgan Adhesives Company: *See*—
Morgan, Burton D., 3,900,645.
Morgan, Burton D., to Morgan Adhesives Company. Scored adhesive laminate. 3,900,645, Cl. 428-41.000.
Moriguchi, Toshiro; Miwa, Kiyoshi; and Shibuya, Takehiro, to Nippon Electric Glass Company, Limited. ZnO-B_2O_3-SiO_2 Glass coating compositions containing Ta_2O_5 and a semiconductor device coated with the same. 3,900,330, Cl. 106-54.000.
Morimoto, Toshio; and Fukunaga, Yoshiaki, to Matsushita Electric Industrial Co., Ltd. Automatic magnetic tape recording and reproducing device. 3,900,174, Cl. 242-209.000.
Morioka, Yasuaki: *See*—
Ito, Shunji; Morioka, Yasuaki; Kajinaga, Yoshihiro; Sakurada, Ichio; and Nitta, Minoru, 3,899,821.
Morishita, Shoji: *See*—
Goto, Hideyuki; Morishita, Shoji; and Usami, Takashi, 3,900,160.
Moriya, Nobuyoshi, to Mansei Kogyo Kabushiki Kaisha. Electric spark generating device for ignitors. 3,900,768, Cl. 317-96.000.
Moskvin, Vladimir Dmitrievich: *See*—
Tjutjunnikov, Anatoly Borisovich; Tjutjunnikov, Boris Nikanorovich; Marchenko, Alexandr Nikolaevich; Burin, Viktor Leontievich; Bolotin, Josif Mironovich; Drozdov, Anatoly Sergeevich; Koval, Leonid Petrovich; Didenko, Zoya Vasilievna; Ljubushkin, Georgy Vasilievich; Budnik, Jury Mikhailovich; Moskvin, Vladimir Dmitrievich; and Bolyanovsky, Dmitry Mikhailovich, 3,900,537.
Moss, Colin Roy: *See*—
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Motorola, Inc.: *See*—
Chruma, Jerry L.; and Hilton, Paul G., 3,900,597.
Hall, Edward L.; and Philofsky, Elliott M., 3,900,598.
Lesk, Israel A., 3,900,345.
Russ, Malcolm J., 3,899,826.
Mott, Claude M.; and Clark, Richard J., to Hewlett-Packard Company. Time interval phase detection in distance measuring apparatus. 3,900,259, Cl. 356-5.000.
Mott, Richard C.: *See*—
Larsen, Larry D.; Schuck, Lee; Pekarek, Joseph C.; and Mott, Richard C., 3,900,795.
Motter, Theodore J.: *See*—
Mattimoe, Paul T.; Motter, Theodore J.; Hofmann, John J.; and Herliczek, Siegfried H., 3,900,673.
Mozer, Larry P.: *See*—
Marrs, Oren L.; and Mozer, Larry P., 3,900,691.
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Muck, Eduard; Strachota, Jaroslav; and Horak, Josef, to Statni vyzkumny ustav kozedelny. Impregnating compositions for fibrous sheet materials. 3,900,621, Cl. 427-430.000.
Mueller, Francis B.: *See*—
Mocny, Richard C.; and Mueller, Francis B., 3,900,179.
Mukogawa, Masashi; and Takagaki, Takashi, to Nippon Electric Company Limited. Method of producing semiconductor integrated circuits with improved isolation structure. 3,900,351, Cl. 148-186.000.
Mulkens, Casper Antonius Henricus, administrator: *See*—
Bertrams, Johannes Kurt, deceased; and Mulkens, Casper Antonius Henricus, administrator, 3,900,240.
Mullane, Joseph J.: *See*—
Selch, Howard I., 3,899,955.
Muller, Friedhelm: *See*—
Dierkes, Hubert; Schonol, Karl; Walter, Joachim; and Muller, Friedhelm, 3,900,608.
Muller, George H., to Ford Motor Company. Compartmented resilient bumper assembly. 3,900,222, Cl. 293-71.00P.
Muller, Karl-Adolf; Gude, Armin; and Menzel, Gerhard, to Chemische Werke Huls Aktiengesellschaft. Polylaurolactam powders suitable for metal coating. 3,900,607, Cl. 427-185.000.
Muller, Richard: *See*—
Wingler, Frank; and Muller, Richard, 3,900,435.
Muller, Willi; and Noll, Hans. Method for the automatic guidance of a work tool on the curves of intersection of two pipes or tubes. 3,900,346, Cl. 148-9.600.
Mulligan, William L.: *See*—
Lee, Charles D., Jr.; and Mulligan, William L., 3,899,868.
Munn, Ben. Joint member and rail with clips for picture framing 3,899,844, Cl. 40-156.000.
Munson, David, deceased: *See*—
Read, Peter John; Latimer, Keith Graham; Reynolds, Terence David Warren; Munson, David, deceased; and Munson, George, administrator, 3,899,820.
Munson, George, administrator: *See*—
Read, Peter John; Latimer, Keith Graham; Reynolds, Terence David Warren; Munson, David, deceased; and Munson, George, administrator, 3,899,820.
Murayama, Yoshimasa: *See*—
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Murrell, Donald K., to Robertshaw Controls Company. Fulcrum pressure regulator. 3,900,045, Cl. 137-505.380.
Muys, Gerard Tuynenburg; Lelieveld, Hubertus Leonardus Maria; and van der Hulst, Robert, to Lever Brothers Company. Sterilization of containers. 3,899,862, Cl. 53-21.0FC.
Myers, Harold J. Aerosol dispensing valve improvements. 3,900,139, Cl. 222-402.240.
Nack, Michael R.; and Crawford, Donald C., to FMC Corporation. Feeding mechanism for wrapping machine. 3,900,096, Cl. 198-23.000.
Nagai, Shozi: *See*—
Shoichiro, Ito; Ohya, Tokuzi; and Nagai, Shozi, 3,900,341.
Nagasaki, Osamu, to Kabushiki Kaisha Suwa Seikosha. Liquid crystal display device. 3,900,248, Cl. 350-160.0LC.
Nagazumi, Yasuo, to Nissan Motor Co., Ltd. Collapsible steering column assembly. 3,899,937, Cl. 74-492.000.
Nakamichi, Niro: *See*—
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Nakamichi Research Inc.: *See*—
Uchikoshi, Goji; and Nakamichi, Niro, 3,900,888.
Nakamura, Takeo: *See*—
Inoue, Tadao; and Nakamura, Takeo, 3,900,114.
Nakamura, Yoshikatsu, to Nippon Piston Ring Co. Ltd. Scuff resistant sliding member. 3,900,200, Cl. 277-235.00A.
Nakamura, Yukiharu: *See*—
Fujii, Tuneo; and Nakamura, Yukiharu, 3,900,658.
Nakano, Toshio: *See*—
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Nakayama, Norihiko: *See*—
Andoh, Shizuo; and Nakayama, Norihiko, 3,900,758.

Nakayama, Ryozo; and Itakura, Sigeru, to Tokai Metals Co., Ltd. Heat resistant material. 3,900,657, Cl. 428-216.000.

Nalco Chemical Company: *See—*
Svarz, Jerry J., 3,900,517.
Werges, Darrell L., 3,900,516.

Nanamatsu, Satoshi: *See—*
Kimura, Masakazu; Nanamatsu, Satoshi; Doi, Kikuo; and Matsushita, Shigeo, 3,900,246.

Narisada, Takehiko: *See—*
Shimada, Kazushi; Maeda, Toru; Nishizawa, Tamotu; Narisada, Takehiko; Anzai, Hisao; and Sasaki, Yositaka, 3,900,453.

Natarelli, Gerard E., Jr.; Pinto, Frank G.; and Miller, Jacob I., to United States of America, Army. Toxic phosphorus compounds. 3,900,535, Cl. 260-945.000.

National Building Industries: *See—*
Glazebrook, Gerald L., 3,899,989.

National Distillers and Chemical Corporation: *See—*
Krackeler, Joseph J.; and Biddell, William G., 3,900,533.

National Research Development Corporation: *See—*
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National Steel Corporation: *See—*
Austin, Lowell W.; and Wilson, Walter Alexander, 3,900,383.

Natsugari, Hideaki: *See—*
Kuwada, Yutaka; Natsugari, Hideaki; and Meguro, Kanji, 3,900,490.

Naylor, Floyd E., to Phillips Petroleum Company. Polyisoprene. 3,900,456, Cl. 260-94.300.

Neimela, Toivo Isak: *See—*
Kaasila, Kauko Johannes; Toivanen, Toivo Adrian; Harkki, Seppo Untamo; Neimela, Toivo Isak; Makipirtti, Simo A.; Malmstrom, Rolf E.; Tuominen, Tapio Kalevi; Aaltonen, Olavi August; and Noponen, Veikko H., 3,900,310.

Nelson, John P.; Page, Robert E.; and Hendrickson, Paul S., to Beloit Corporation. Roll-out module for a papermaking press section. 3,900,364, Cl. 162-274.000.

Neugodov, Petr Petrovich: *See—*
Filipin, Nikolai Andreevich; Alexander, Jury Vladimirovich; Poddubny, Jury Alexandrovich; Mozhzhukhin, Valentin Sergeevich; and Neugodov, Petr Petrovich, 3,900,339.

Neumunstersche Maschinen-und Apparatebau GmbH: *See—*
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Neville, James J.; Ferrell, Wesley; and Shichman, Daniel, to Uniroyal, Inc. Zero degree belted tires built with high soft stretch belt-forming tapes. 3,900,062, Cl. 152-361.0FP.

Newage Engineers Limited: *See—*
Spencer, Kenneth Morgan, 3,899,958.

Newby, Ronald, to John Laing and Son Limited. Apparatus for forming a pattern on the surface of a moldable material. 3,900,279, Cl. 425-385.000.

Newell, Norman M. Entrance door and method of construction. 3,899,860, Cl. 52-313.000.

Newton, Alwin B., to Borg-Warner Corporation. Rotary compressor. 3,900,277, Cl. 418-184.000.

Nichols, Gust: *See—*
Buckler, Robert Thomas; Hartzler, Harold Eugene; Hayao, Shin; and Nichols, Gust, 3,900,492.

Nichols, Peter H.: *See—*
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Niederprum, Hans: *See—*
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Nield, Eric: *See—*
Mathews, Carl Fraser; Nield, Eric; Rose, John Brewster; and Vincent, Peter Incledon, 3,900,531.

Niepmann, Otto, to Maschinenfabrik Fr. Niepmann & Co. Device for the print-referenced cutting of a printed web. 3,899,946, Cl. 83-75.000.

Nii, Hiroshi: *See—*
Makishima, Hiroshi; Shinohara, Toshio; Kawahara, Yukio; Nii, Hiroshi; and Ebine, Setsuo, 3,900,630.

Nikolaev, Alexandr Vasilievich: *See—*
Tupolev, Andrei Nikolaevich; Tupolev, Alexei Andreevich; Minkner, Kurt Vladimirovich; Bonin, Alexandr Romanovich; Cheremukhin, Georgy Alexeevich; Bliznjuk, Valentin Ivanovich; Pukhov, Alexandr Leonidovich; Svischev, Georgy Petrovich; Bjushgens, Georgy Sergeevich; Nikolaev, Alexandr Vasilievich; and Mikeladze, Vitaly Georgievich, 3,900,178.

Nilles, Paul Emile, to Centre de Recherches Metallurgiques. Conversion of pig iron into steel. 3,900,311, Cl. 75-60.000.

Nilsson, Jan: *See—*
Andersson, Conny; Hanas, Bertil; Korsell, Torsten; and Nilsson, Jan, 3,900,695.

Ning, Robert Ye-Fong; and Sternbach, Leo Henryk, to Hoffmann-La Roche Inc. Benzophenone intermediates for 7-lower alkanoyl benzodiazepines. 3,900,501, Cl. 260-340.900.

Nipkiep: *See—*
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Nippon Columbia Kabushiki Kaisha: *See—*
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Nippon Electric Company Limited: *See—*
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Nippon Electric Glass Company, Limited: *See—*
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Kogaku K.K.: *See—*
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Nippon Kokan Kabushiki Kaisha: *See—*
Aramaki, Keiichi, 3,899,910.

Nippon Oil Seal Industry Company Limited: *See—*
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Nippon Paint Co., Ltd.: *See—*
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Nippon Piston Ring Co. Ltd.: *See—*
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Nippon Steel Corporation: *See—*
Soga, Hiromu; Minamida, Katsuhiro; Kurasawa, Kazuo; and Ii, Masatake, 3,900,887.

Niro-Plan AG Oftringen: *See—*
Graber, Andreas; and Horr, Claus, 3,900,040.

Nishigaki, Katumi: *See—*
Takashima, Kazushige; Nishigaki, Katumi; and Yamashita, Terumasa, 3,900,775.

Nishigaki, Yasuo: *See—*
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Nishino, Yoshinori: *See—*
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Nishizawa, Tamotu: *See—*
Shimada, Kazushi; Maeda, Toru; Nishizawa, Tamotu; Narisada, Takehiko; Anzai, Hisao; and Sasaki, Yositaka, 3,900,453.

Nissan Motor Co., Ltd.: *See—*
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Nagazumi, Yasuo, 3,899,937.
Otani, Syuichi, 3,900,078.
Sakamoto, Kenichi; and Kawamoto, Tamio, 3,900,082.
Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, 3,899,898.

Nitta, Minoru: *See—*
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Noll, Hans: *See—*
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Noll, Klaus: *See—*
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Noma Lites Canada Limited: *See—*
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Nony, Maurice: *See—*
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Noponen, Veikko H.: *See—*
Kaasila, Kauko Johannes; Toivanen, Toivo Adrian; Harkki, Seppo Untamo; Neimela, Toivo Isak; Makipirtti, Simo A.; Malmstrom, Rolf E.; Tuominen, Tapio Kalevi; Aaltonen, Olavi August; and Noponen, Veikko H., 3,900,310.

Norgate, Peter: *See—*
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Norris, Robert W., Jr. Method of forming traffic markers having short track-free times. 3,900,605, Cl. 427-137.000.

Norsk Hydro A.S.: *See—*
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North American Philips Corporation: *See—*
Berkelhamer, Louis H.; and Schapira, William H., 3,900,818.

Northern Electric Company Limited: *See—*
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Zaky, Safwat George, 3,900,247.

Northrop Corporation: *See—*
Conner, Jack S., 3,900,198.

Northup, Francis B.; and Hart, Donald R., to Spanco Yarns, Inc. Method and apparatus for forming helically wrapped yarns. 3,899,867, Cl. 57-18.000.

Notari, Bruno: *See—*
Fattore, Vittorio; Moreschini, Paolo; and Notari, Bruno, 3,900,426.

Novikov, Andrei Porfirievich: *See—*
Somov, Boris Stepanovich; Mamin, Alexandr Ilich; Novikov, Andrei Porfirievich; Filippov, Vyacheslav Ivanovich; Khirdzhiev, Sergei Grigorievich; Gurevich, Vladimir Zakharovich; Voronov, Nikolai Stefanovich; and Agafonov, Ivan Fedorovich, 3,899,908.

Nowack, Gerhard P.: *See—*
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Nowak, Herbert: *See—*
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Nozeran, Robert: *See—*
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N.V. Bekaert S.A.: *See—*
Moens, Joris, 3,900,667.

N.V. Internationale Octrooi Maatschappij "Octropa": *See—*
Hornstra, Gerard, 3,900,290.

Nylander, Alfred F. Processing tachydrite ore. 3,900,553, Cl. 423-184.000.

O.M.I. Corporation of America: *See—*
Friedman, Seymour Jack, 3,900,859.

Oachis, Emil: *See—*
Constantinescu, Petre; Oachis, Emil; Trimbitas, Dorin; and Alexandrescu, Doina, 3,900,301.
Oakes, George W.: *See—*
Melnick, Irving; and Oakes, George W., 3,900,029.
Odman, Rolf Ragnar: *See—*
Sjoberg, Borje Gustav; Odman, Rolf Ragnar; Belstad, Arne; and Lofgren, Nils Clov Allan, 3,900,293.
Offermanns, Heribert: *See—*
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Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.): *See—*
Galmiche, Philippe Marie; and Hivert, Andre, 3,900,613.
Ogier, Paul; and Queyroix, Christian, to Agence Nationale de Valorisation de la Recherche (ANVAR). Sheetmetal rolling machine. 3,899,911, Cl. 72-169.000.
Oguri, Eizo: *See—*
Komatani, Taro; Yamada, Kazuo; Oguri, Eizo; and Tokuda, Yasunori, 3,900,462.
Ohara, Osamu; and Wakabayashi, Nobuyoshi, to Kuraray Co., Ltd. Adhesive composition. 3,900,440, Cl. 260-29.70W.
Ohm, George D., to B. F. Goodrich Company, The. Molded track for a track-laying vehicle. 3,900,231, Cl. 305-35.0EB.
Ohno, Kazuaki: *See—*
Hammond, Vivan Joseph; Norgate, Peter; Onoki, Fumio; Kamiya, Hajime; and Ohno, Kazuaki, 3,900,672.
Ohsawa, Mitsuo, to Sony Corporation. Constant current circuit 3,900,790, Cl. 323-4.000.
Ohya, Tokuzi: *See—*
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Oishi, Yasushi; Hayashi, Jun; and Yoshida, Yoshinobu, to Fuji Photo Film Co., Ltd. Diffusion transfer color photographic material having developement inhibitor precursor. 3,900,322, Cl. 96-77.000.
Okada, Hiroshi: *See—*
Enei, Hitoshi; Sato, Katsuaki; Anzai, Yasuo; and Okada, Hiroshi, 3,900,368.
Okamoto, Shigetake, to Agency of Industrial Science & Technology. Method for chemical vapor deposition of fitted surfaces in coupled article. 3,900,612, Cl. 427-232.000.
Okamoto, Toshio: *See—*
Aishima, Itsuho; Fukuma, Noboru; Sakura, Hisaya; Chayamiti, Hiroshi; Okamoto, Toshio; Doi, Yuzuru; and Henmi, Hiroshi, 3,900,678.
Oklejas, Eli, Jr.: *See—*
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Oklejas, Robert A.; and Oklejas, Eli, Jr. Gas regeneration tesla-type turbine. 3,899,875, Cl. 60-39.51R.
Oku, Takeshi; and Tanaka, Masaru, to Matsushita Electric Industrial Co., Ltd. Waveform generator. 3,900,745, Cl. 307-260.000.
Olcott, Eugene L., to Atlantic Research Corporation. Internal components for gas turbines of pyrolytic graphite silicon carbide codeposit. 3,900,668, Cl. 428-297.000.
Olcott, Eugene L., to Atlantic Research Corporation. Rocket nozzle comprising pyrolytic graphite-silicon carbide microcomposite inserts. 3,900,675, Cl. 428-367.000.
Olin Corporation: *See—*
Gay, Walter A.; and Tobin, John H., 3,900,519.
Ralston, Richard W., Jr., 3,900,373.
Oliver, Bruce L.; and Heinemeyer, Ben W., to Dow Chemical Company, The. Method of enhancing flexure of plastic hinges. 3,900,550, Cl. 264-320.000.
Oliver, Calvin C.: *See—*
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Oliver, Haven D.; Burke, Richard K.; Dobson, Herbert, Jr.; and Grant, Leon E., to United States of America, Navy. Dual filter for lubricating oil. 3,900,401, Cl. 210-238.000.
O'Loughlin, James F.: *See—*
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Olsen Axle & Equipment Company Inc.: *See—*
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Olsen Controls, Inc.: *See—*
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Olsen, Harold L., to Olsen Axle & Equipment Company Inc. Vehicle stabilized for heavy duty use. 3,900,119, Cl. 214-86.00A.
Olsen, Jan-Erik: *See—*
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Olsen, Zenny, to Olsen Controls, Inc. Linear electrohydraulic pulse drive actuator. 3,899,956, Cl. 91-368.000.
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Onikov, Eduard Arshakovich: *See—*
Zabotin, Alexandr Alexandrovich; Onikov, Eduard Arshakovich; Galperin, Alexandr Lvovich; Loschilin, Evgeny Dmitrievich; Lileev, Valerian Petrovich; German, Roman Anatolievich; Rutkevich, Zinovy Yakovlevich; and Sakharov, Boris Alexandrovich, 3,900,049.
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Onoki, Fumio: *See—*
Hammond, Vivan Joseph; Norgate, Peter; Onoki, Fumio; Kamiya, Hajime; and Ohno, Kazuaki, 3,900,672.
Orain, Michel, to Societe Anonyme: Glaenzer Spicer. Method and device for cold-forming rolling elements. 3,899,912, Cl. 72-344.000.
O'Rell, Dale H.: *See—*
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Organisation Europeenne de Recherches Spatiales: *See—*
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Ortho Pharmaceutical Corporation: *See—*
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Osaka Gas Company, Ltd.: *See—*
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Osaka University: *See—*
Fujisawa, Kazuo, 3,900,759.
Osakabe, Kuniharu; and Yonai, Fumiaki, to Hitachi, Ltd. Exposure apparatus for forming fluorescent screens of colour picture tubes. 3,900,854, Cl. 354-1.000.
Ostbo, John David Bertil. Method for manufacturing curved tube sections. 3,899,819, Cl. 29-407.000.
Osterholtz, Frederick D.: *See—*
Yen, Steven N.; and Osterholtz, Frederick D., 3,900,378.
Otani, Syuichi, to Nissan Motor Co., Ltd. Safety harness arrangement. 3,900,078, Cl. 180-82.00R.
Otto Hansel GmbH: *See—*
Revaz, Leon, 3,899,865.
Outokumpu Oy: *See—*
Kaasila, Kauko Johannes; Toivanen, Toivo Adrian; Harkki, Seppo Untamo; Neimela, Toivo Isak; Makipirtti, Simo A.; Malmstrom, Rolf E.; Tuominen, Tapio Kalevi; Aaltonen, Olavi August; and Noponen, Veikko H., 3,900,310.
Tuovinen, Frans Heikki; Blomquist, Seppo Ilmari; Heikkila, Risto Markus; Honkasalo, Jorma Bruno; and Kunttu, Kalevi Johan, 3,900,117.
Overhead Door Corporation: *See—*
Cunha, Joseph J., 3,900,213.
Owens-Corning Fiberglas Corporation: *See—*
Bell, Reuben H.; and Foley, Kevin M., 3,900,506.
Isham, Allan B.; and Shenk, Wilbur, III, 3,900,048.
Langlois, Roland E.; and Roberson, Cletis L., 3,900,302.
Marzocchi, Alfred, 3,900,679.
McCombs, Frank Paul, 3,900,661.
Rosinski, Klaus D.; and Schroer, John W., 3,900,584.
Owens-Illinois, Inc.: *See—*
Crawford, James E., 3,900,530.
Grubb, Everett F.; Hagedorn, Erwin C.; and Monks, Joseph R., 3,900,329.
Taylor, Lynn J., 3,900,682.
Ozaki, Nobuo, to Maeda Industries, Ltd. Bicycle free wheel assembly. 3,900,088, Cl. 192-64.000.
Ozalid Company, Ltd.: *See—*
Landau, Raphael, 3,900,324.
Pacific Car and Foundry Company: *See—*
Jayne, Laurence I.; and Magnuson, Roland A., 3,899,954.
Paden, Richard Stephen: *See—*
Kynaston, David; Tillett, Peter Irving; and Paden, Richard Stephen, 3,900,734.
Page, Frederick Walter; and Wardle, Peter Charles Darlington. Automatically operated vehicle restraint mechanism. 3,900,092, Cl. 194-9.00T.
Page, Robert E.: *See—*
Nelson, John P.; Page, Robert E.; and Hendrickson, Paul S., 3,900,364.
Pall Corporation: *See—*
Keedwell, Cyril A., 3,900,027.
Palmour, Hayne, III; and Huckabee, Marvin L., to Arthur D. Little, Inc. Process for sintering finely divided particulates and resulting ceramic products. 3,900,542, Cl. 264-40.000.
Paranto, Archie V., to Draft Meter Corporation. Liquid dispensing apparatus. 3,900,136, Cl. 222-70.000.
Park, Yong S., to Zenith Radio Corporation. Apparatus for making light attenuating filters. 3,899,996, Cl. 118-49.100.
Parke, James G.; and Gerlach, C. Richard, to Micro-Gen Equipment Corporation. Hand carried spraying apparatus. 3,900,165, Cl. 239-375.000.
Parker, Delmer G.: *See—*
Fraser, Lawrence J.; and Parker, Delmer G., 3,900,001.
Parker, Stephen R., to Westinghouse Electric Corporation. Gas turbine combustor basket cooling. 3,899,882, Cl. 60-39.650.
Parks-Cramer Company: *See—*
Lee, Charles D., Jr.; and Mulligan, William L., 3,899,868.
Parsons, William F.; Blair, Gerald E.; and Maier, Clarence C., to Eastman Kodak Company. Method and apparatus for molding glass lenses. 3,900,328, Cl. 106-39.500.
Paton, Boris Evgenievich; Gusev, Vladimir Alexeevich; Dudko, Daniil Andreevich; Maximovich, Boleslav Ivanovich; and Asoyants, Grigory Bagradovich. Method of producing anti-skid studs for vehicle tires. 3,900,149, Cl. 228-122.000.
Patten, Hudson T., III: *See—*
Lynch, Thomas H.; and Patten, Hudson T., III, 3,900,839.
Patterson, Frank Knowles: *See—*
Marcus, Sanford Morton; and Patterson, Frank Knowles, 3,900,432.
Patzer, Hans E.: *See—*
Marriott, Carroll L.; Patzer, Hans E.; Hall, Ronald D.; Caposell, Charles D.; and Klein, Aaron David, 3,900,353.

Pauza, William Vito: *See—*
Sheesley, Wilmer Lee; and Pauza, William Vito, 3,900,709.

Pavlot, James, to Midland-Ross Corporation. Channel joint and joiner therefor. 3,900,269, Cl. 403-292.000.

Pearce, Derek Roger: *See—*
Davis, Benjamin; and Pearce, Derek Roger, 3,900,561.

Pechiney Progil: *See—*
Poignant, Pierre; and Delage, Pierre, 3,900,308.

Pedain, Josef: *See—*
Thoma, Wilhelm; Noll, Klaus; Pedain, Josef; and Koch, Hans Joachim, 3,900,688.

Peer, Herbert R., to Ferma-Gro Corporation. Nutrient composition for plants and animals. 3,900,572, Cl. 426-41.000.

Pekarek, Joseph C.: *See—*
Larsen, Larry D.; Schuck, Lee; Pekarek, Joseph C.; and Mott, Richard C., 3,900,795.

Penberthy, Harvey Larry. Backpacker's stove. 3,900,281, Cl. 431-344.000.

Penco Products Inc.: *See—*
Hiler, Roy R.; and Hohl, Robert W., 3,900,111.

Penczynksi, Peter; Matthaus, Gunther; Massek, Peter; and Liendl, Johann, to Siemens Aktiengesellschaft. High-voltage and coolant feed apparatus for low temperature cooled conductors. 3,900,699, Cl. 174-15.0BH.

Penn-Plax Plastics, Inc.: *See—*
Goldman, Marvin A.; and Goldman, Jerome N., 3,900,004.

Pennwalt Corporation: *See—*
Mandell, Harry Creston, Jr., 3,900,606.

Person, Herman R., to Dale Electronics, Inc. Surge arrestor. 3,900,767, Cl. 317-61.500.

Pervukhin, Leonid Borisovich: *See—*
Apalikov, Jury Ignatievich; Konon, Jury Alexeevich; Pervukhin, Leonid Borisovich; and Tsemakhovich, Boris Davydovich, 3,900,147.

Pesaro, Mario: *See—*
Dubs, Paul; Kuntzel, Heiner; and Pesaro, Mario, 3,900,498.

Peter, Richard: *See—*
Wegmann, Jacques; and Peter, Richard, 3,900,286.

Peterson, Henry O., to Leupold & Stevens, Inc. Piezoelectric traffic counter switch and associated pulse generator circuit. 3,900,830, Cl. 340-38.00R.

Peterson, Wendell C. Elongated surgical instrument holder. 3,900,109, Cl. 211-60.00T.

Petro-Tex Chemical Corporation: *See—*
Christmann, Harold F.; and Teel, Paul H., 3,900,525.

Petron, Dennis A.: *See—*
Scott, William G.; Zickgraf, John H.; and Petron, Dennis A., 3,900,849.

Pfizer Inc.: *See—*
Robba, William A.; and Froberg, Robert W., 3,900,540.

Philip A. Hunt Chemical Corporation: *See—*
Kosel, George E., 3,900,412.

Philipp, Adolf H.; Demerson, Christopher A.; and Humber, Leslie G., to Ayerst McKenna and Harrison Ltd. 5-Amino-and 5-hydrazinodihydropyrroloisoquinoline derivatives. 3,900,477, Cl. 260-288.0CF.

Phillips Cables Limited: *See—*
Beach, Shirley M., 3,899,824.

Phillips Petroleum Company: *See—*
Childs, William V.; Ashe, Benedict H., Jr.; and Hudson, Paul S., 3,900,372.
Clampitt, Richard L.; and Hessert, James E., 3,900,406.
Hunt, Harold R.; and Vanderveen, John W., 3,900,547.
Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., 3,900,526.
Jurrens, Lawrence D., 3,900,694.
Marrs, Oren L.; and Mozer, Larry P., 3,900,691.
Naylor, Floyd E., 3,900,456.
Rostler, Fritz S., 3,900,692.
Witt, Donald R., 3,900,457.

Phillips, Robert E., to Minnesota Mining and Manufacturing Company. Medicament dispenser. 3,900,138, Cl. 222-340.000.

Philofsky, Elliott M.: *See—*
Hall, Edward L.; and Philofsky, Elliott M., 3,900,598.

Pinto, Frank G.: *See—*
Natarelli, Gerard E., Jr.; Pinto, Frank G.; and Miller, Jacob I., 3,900,535.

Piron, Jean Gustave Jules. Patterned transfer sheet. 3,900,633, Cl. 428-204.000.

Pitanis, Nicholas James. Dual purpose sock holder. 3,900,181, Cl. 248-340.000.

Piunno, Carmen, to Human Circle, Inc., The. Mosquito-bite itch stopper. 3,900,018, Cl. 128-1.00R.

Plasko, Emil Robert, to Micro Devices Corporation. Thermal limiter construction and electrical switch and system utilizing the same. 3,900,713, Cl. 219-10.55D.

Platz, Stephan: *See—*
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Platz, Stephan; Friedsam, Josef; Schweicher, Wolfgang; Behr, Rolf; Wasser, Willi; and Browatzki, Kurt, 3,900,326.

Plotnikov, Valerian Valerievich: *See—*
Privalov, Petr Leonidovich; Makurin, Pavel Semenovich; Plotnikov, Valerian Valerievich; Koryagin, Vladimir Vasilievich; Polpudnikov, Viktor Sergeevich; and Stepanjuk, Georgy Pavlovich, 3,899,918.

Plumat, Emile; and Demoulin, Pierre, to Glaverbel-Mecaniver S.A. Glazing panel with conductive strips. 3,900,634, Cl. 428-208.000.

Plummer, William T.: *See—*
McCann, Mary Conlin; Plummer, William T.; and Walworth, Vivian K., 3,900,858.

Poddubny, Jury Alexandrovich: *See—*
Filipin, Nikolai Andreevich; Alexander, Jury Vladimirovich; Poddubny, Jury Alexandrovich; Mozhzhukhin, Valentin Sergeevich; and Neugodov, Petr Petrovich, 3,900,339.

Poignant, Pierre; and Delage, Pierre, to Pechiney Progil. Herbicidal mono and disubstituted amides of phenoxyaliphatic carboxylic acids. 3,900,308, Cl. 71-118.000.

Polaroid Corporation: *See—*
Lehmann, Walter G., 3,900,860.
MacLeish, William T.; and Milligan, Terry W., 3,900,323.
McCann, Mary Conlin; Plummer, William T.; and Walworth, Vivian K., 3,900,858.
Stempeck, John W., 3,900,855.

Polgar, Livia: *See—*
Lubbock, Frederick John; and Polgar, Livia, 3,900,336.

Pollman, Frederic W.: *See—*
Schafer, James D.; and Pollman, Frederic W., 3,900,223.

Pollner, Max: *See—*
Theisz, Franz; Pollner, Max; and Holl, Roland, 3,900,193.

Polpudnikov, Viktor Sergeevich: *See—*
Privalov, Petr Leonidovich; Makurin, Pavel Semenovich; Plotnikov, Valerian Valerievich; Koryagin, Vladimir Vasilievich; Polpudnikov, Viktor Sergeevich; and Stepanjuk, Georgy Pavlovich, 3,899,918.

Pomerantz, Alfred: *See—*
Pomerantz, Alfred S.; and Andrassy, Imre A., 3,900,798.

Pomerantz, Alfred S.; and Andrassy, Imre A., to Pomerantz, Alfred. Radio solid state crescendo volume alarm. 3,900,798, Cl. 325-396.000.

Pont-a-Mousson A.G.: *See—*
Hauth, Jean-Marc Laurent, 3,900,083.

Porret, Daniel: *See—*
Habermeier, Jurgen; Batzer, Hans; and Porret, Daniel, 3,900,493.

Post Office, The: *See—*
Dyott, Richard Burnaby; and Stewart, John Hill, 3,900,245.

Potter, John. Squeezably actuated general purpose electric switch. 3,900,710, Cl. 200-81.00H.

Potter, Michael David, to International Business Machines Corporation. Isolated fixed and variable threshold field effect transistor fabrication technique. 3,900,352, Cl. 148-187.000.

Pouska, George A.: *See—*
Kersch, Keith M.; Pouska, George A.; Drayer, Dennis E.; and Tackett, James E., Jr., 3,900,041.
Merrill, La Vaun S., Jr.; Drayer, Dennis E.; Gogarty, William B.; and Pouska, George A., 3,900,391.

Powers, Richard T. Trash compactor. 3,899,967, Cl. 100-269.00R.

Powers, Richard T. Tow bar assembly for water-ski towing device. 3,899,993, Cl. 115-6.100.

Powers, Robert W., to General Electric Company. Method of forming beta-alumina articles. 3,900,381, Cl. 204-181.000.

PPG Industries, Inc.: *See—*
Ammons, Vernon G.; and Vanek, James C., 3,900,686.
Franz, Helmut; and Lecocq, David E., 3,900,601.
Gunby, Leslie, 3,900,384.

Prahl, Herman. Cylinder lock assembly. 3,899,907, Cl. 70-370.000.

Preston, Harold M., to General Mills Chemicals, Inc. New method for the preparation of polyamide adduct. 3,900,437, Cl. 260-18.0PN.

Preston, James N. Gravity simulator and exercizing device. 3,900,195, Cl. 272-57.00R.

Preston, Joseph Ronald: *See—*
Leininger, Robert Irvin; Preston, Joseph Ronald; and Lower, Brenton Ray, 3,900,033.

Prino, Giuseppe: *See—*
Butti, Adriano; and Prino, Giuseppe, 3,900,458.

Privalov, Petr Leonidovich; Makurin, Pavel Semenovich; Plotnikov, Valerian Valerievich; Koryagin, Vladimir Vasilievich; Polpudnikov, Viktor Sergeevich; and Stepanjuk, Georgy Pavlovich. Differential microcalorimeter. 3,899,918, Cl. 73-15.00B.

Products Research & Chemical Corporation: *See—*
Kay, Carl Joseph, 3,900,439.

Proksch, Frederick D.: *See—*
Unruh, Dale H.; and Proksch, Frederick D., 3,900,042.

Prost, Kalman J.: *See—*
Hampel, Daniel; Prost, Kalman J.; and Scheinberg, Norman R., 3,900,742.

Puddington, Ira E.: *See—*
Meadus, Frederick W.; Sparks, Bryan D.; and Puddington, Ira E., 3,900,317.

Pugi, Kalev: *See—*
Jaswal, Iqbalsingh; and Pugi, Kalev, 3,900,450.

Pukhov, Alexandr Leonidovich: *See—*
Tupolev, Andrei Nikolaevich; Tupolev, Alexei Andreevich; Minkner, Kurt Vladimirovich; Bonin, Alexandr Romanovich; Cheremukhin, Georgy Alexeevich; Bliznjuk, Valentin Ivanovich; Pukhov, Alexandr Leonidovich; Svischev, Georgy Petrovich; Bjushgens, Georgy Sergeevich; Nikolaev, Alexandr Vasilievich; and Mikeladze, Vitaly Georgievich, 3,900,178.

Pulaski, Gregory F.: *See—*
Sackoff, Martin M.; and Pulaski, Gregory F., 3,900,644.

Puleo, Salvatore J. Artificial Christmas tree with slanted needles. 3,900,539, Cl. 264-27.000.

Punt, Vernon E., to Xerox Corporation. Spherical potentiometer with ball contact means. 3,900,817, Cl. 338-157.000.

Purdy, David L.; and Williams, John F., to Arco Nuclear Company. Method of metals joining. 3,900,152, Cl. 228-221.000.

Queyroix, Christian: *See—*
Ogier, Paul; and Queyroix, Christian, 3,899,911.

Quist, Donald G.: *See—*
Thomas, Virgil E., Jr.; and Quist, Donald G., 3,900,704.

Quitt, Peter: *See—*
Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Franziska, heir; Vogler, Niklaus E., heir; and Vogler, Heinrich, heir, 3,900,464.

R. L. Kuss & Co., Inc.: *See—*
Bell, Rupert B., 3,900,397.

Racky, Werner; Kleiner, Hans-Jerg; and Herwig, Walter, to Hoechst Aktiengesellschaft. Flame resistant thermoplastic polyesters. 3,900,444, Cl. 260-45.75P.

Radscheit, Kurt; Stache, Ulrich; Fritsch, Werner; and Haede, Werner, to Hoechst Aktiengesellschaft. Process for the manufacture of delta 14-20-keto-21-dialkoxy steroids. 3,900,502, Cl. 260-397.470.

Raeithel, Heinrich: *See—*
Morawski, Wilhelm; and Raeithel, Heinrich, 3,900,739.

Raether, Wolfgang: *See—*
Winkelmann, Erhardt; and Raether, Wolfgang, 3,900,482.

Raines, Kenneth: *See—*
Burke, George K.; Raines, Kenneth; and Le Fevre, Robert J., 3,900,184.

Rakshys, Joseph W., Jr.: *See—*
Mitchell, Albertha B.; McKinley, Suzanne V.; and Rakshys, Joseph W., Jr., 3,900,451.

Ralston, Richard W., Jr., to Olin Corporation. Method of regulating anode-cathode spacing in an electrolytic cell. 3,900,373, Cl. 204-99.000.

Randle, Raymond Thomas; Williamson, John; and Wilson, David, to Steetley (Mfg.) Limited. Filtration apparatus. 3,900,403, Cl. 210-350.000.

Randtron: *See—*
Wilson, Earl D., 3,900,393.

Rank Xerox Ltd.: *See—*
Yamamoto, Kazunobu, 3,900,255.

Rapoport, Joseph, to Hygrade Foods Inc. Preparation of coated hams. 3,900,575, Cl. 426-305.000.

Raschke, Curt Robert, to Addressograph-Multigraph Corporation. Developing method for plain paper copying. 3,900,852, Cl. 346-74.0ES.

Rasmussen, Chris Royce, to McNeil Laboratories, Incorporated. Esters of benzothiazine-1,1-dioxides derivatives. 3,900,470, Cl. 260-243.00R.

Rath, Karl Friedrich. Method and apparatus for planting plants. 3,899,985, Cl. 111-3.000.

Rau, Arthur: *See—*
Wild, Hermann; and Rau, Arthur, 3,899,845.

Rauser, Jan Axel Ingemar: *See—*
Rausing, Hans A.; Olsen, Jan-Erik; and Rauser, Jan Axel Ingemar, 3,900,155.

Rausing, Hans A.; Olsen, Jan-Erik; and Rauser, Jan Axel Ingemar, to Tetra Pak Development SA. Package. 3,900,155, Cl. 229-7.00R.

Ravera, Giovanni; Siletto, Giorgio; and Bellis, Carlo, to Ing. C. Olivette & C., S.p.A. Electrostatic copying machine and synchronizing control system therefor. 3,900,256, Cl. 355-14.000.

Raychem Corporation: *See—*
Sovish, Richard C.; Sullivan, Michael B.; and Wetmore, Judson D., 3,899,807.

Raymond Lee Organization, Inc., The: *See—*
Heppell, Douglas Fraser, 3,900,047.
Wertman, Charles D., 3,899,853.

Raytheon Company: *See—*
Tisdale, Lawrence H.; and Lesensky, Leonard, 3,900,755.
Tsao, Carson K. H., 3,900,878.

RCA Corporation: *See—*
Feldstein, Nathan, 3,900,599.
Weimer, Paul Kessler, 3,900,743.
Wu, Chin Tao, 3,900,717.

Rea, Donald E., to Jones, Spencer D. Scaffold apparatus. 3,900,080, Cl. 182-36.000.

Read, Peter John; Latimer, Keith Graham; Reynolds, Terence David Warren; Munson, David, deceased; and by Munson, George, administrator, to Alcan Research and Development Limited. Method of producing a dispersion-strengthened aluminum alloy article. 3,899,820, Cl. 29-420.500.

RedKen Laboratories: *See—*
Di Salvo, Ronald M.; and Yates, Robert W., 3,900,252.

Regan, Lance. Adaptor for common pianos. 3,899,952, Cl. 84-236.000.

Regie Nationale des Usines Renault: *See—*
Froumajou, Armand, 3,899,934.

Rehmus, Frederick H., to Jones & Laughlin Steel Corporation. Method of reducing H_2S emissions during slag quenching. 3,900,304, Cl. 65-19.000.

Reliance Electric Company: *See—*
Williams, Roger B., Jr.; Loshbough, Richard C.; and Cherry, Richard A., 3,899,915.

Rembold, Heinz; Haug, Theobald; Wyler, Sigfried; and Kiefer, Jurg, to Ciba-Geigy Corporation. Storage-stable and thermosetting mixtures. 3,900,449, Cl. 260-78.0UA.

Rendulic, Francis J.: *See—*
Guthrie, James L.; and Rendulic, Francis J., 3,900,594.

Renis, Harold E.; and Skaletzky, Louis L., to Upjohn Company, The. 2[2'-Pyrimidylamino]quinazolines and their preparation. 3,900,476, Cl. 260-256.40Q.

Renner, Theodor: *See—*
Rittmayer, Gerhard; Renner, Theodor; Grubmuller, Georg; and Falkenberg, Dieter, 3,900,603.

Rensmann, Leo: *See—*
Hoppe, Gerhard; Leppek, Heinrich; Rensmann, Leo; and Kehr, Helmut, 3,900,361.

Research Corporation: *See—*
Johnson, William H., 3,899,836.

Research Laboratories of Australia Pty. Limited: *See—*
Wright, Robert J., 3,900,586.

Revaz, Leon, to Otto Hansel GmbH. Wrapping apparatus. 3,899,865, Cl. 53-234.000.

Reynolds, Terence David Warren: *See—*
Read, Peter John; Latimer, Keith Graham; Reynolds, Terence David Warren; Munson, David, deceased; and Munson, George, administrator, 3,899,820.

Rheinmetall GmbH: *See—*
Harnau, Hans-Dieter, 3,899,974.
Luther, Hans Werner; Romer, Rudolf; Winkelmann, Jurgen; and Rossmann, Winfried, 3,899,978.

Rhodes, John Kenneth, to Rolls-Royce (1971) Limited. Shaft couplings. 3,900,270, Cl. 403-317.000.

Riboulet, Robert; and Charvet, Eugene, to La Cellophane. Composite polyester films and process for producing the same. 3,900,653, Cl. 428-212.000.

Rice, Dale W.: *See—*
Herczog, Andrew; Layton, Margaret M.; and Rice, Dale W., 3,900,593.

Richards Manufacturing Company, Inc.: *See—*
Armstrong, Beverly W., 3,899,822.

Richardson, Donald A., to GTE Sylvania Incorporated. High pressure sodium vapor lamp having low starting voltage. 3,900,753, Cl. 313-198.000.

Richardson-Merrell Inc.: *See—*
Griser, Johann Martin; and Blohm, Thomas R., 3,900,565.
Kinsolving, C. Richard, 3,900,558.

Richter, Ian A., to United States of America, General Counsel-Code GP. The United States of America as represented by the National Aeronautics and Space Administration Office of General Counsel-Code GP. 3,900,705, Cl. 178-6.800.

Richter, Lewis. Rotary air compressor. 3,900,275, Cl. 417-203.000.

Richter, Sidney B.; and Krenzer, John, to Velsicol Chemical Corporation. Dithianyl anilids. 3,900,497, Cl. 260-327.00M.

Ricketts, James M.: *See—*
Flanigan, Eugene E.; Heintzelman, Quinton L.; and Ricketts, James M., 3,899,877.

Ricoh Co., Ltd.: *See—*
Yamauchi, Satoshi, 3,900,719.

Riker Laboratories, Inc.: *See—*
Banitt, Elden H.; and Bronn, William R., 3,900,481.

Riley, Kenneth L.; and Sawyer, Willard H., to Exxon Research and Engineering Company. Hydroprocessing catalyst. 3,900,427, Cl. 252-455.00R.

Ringot, Claude: *See—*
Bujas, Roke; and Ringot, Claude, 3,900,358.

Rist's Wires & Cables Limited: *See—*
Fry, William Lawrence, 3,900,241.

Rittmayer, Gerhard; Renner, Theodor; Grubmuller, Georg; and Falkenberg, Dieter, to Siemens Aktiengesellschaft. Method and device for producing a thermoelectric generator. 3,900,603, Cl. 427-124.000.

Robba, William A.; and Froberg, Robert W., to Pfizer Inc. Method for making a film of refractory material having bi-directional reinforcing properties. 3,900,540, Cl. 264-29.000.

Roberson, Cletis L.: *See—*
Langlois, Roland E.; and Roberson, Cletis L., 3,900,302.

Robert Bosch G.m.b.H.: *See—*
Bundesen, Lorenz; Brettschneider, Johannes; and Knapp, Heinrich, 3,900,014.
Haubner, Georg; Hofer, Walter; and Schmaldienst, Peter, 3,900,016.
Wahl, Josef; and Schmidt, Peter-Jurgen, 3,900,012.

Robertshaw Controls Company: *See—*
Flumm, Paul T.; and Harris, Vernon B., 3,899,872.
Murrell, Donald K., 3,900,045.

Robertson, Jeffrey C., to Eastman Kodak Company. Film cartridge. 3,900,169, Cl. 242-194.000.

Robinson, Edward H. Fingerprinting arrangement. 3,899,995, Cl. 118-31.500.

Robinson, Eric, to Lambeg Industrial Research Association. Catalyst for oxidation of hydrocarbons and method of making same. 3,900,425, Cl. 252-430.000.

Robinson, James E., to Kimberly-Clark Corporation. Laminate of tissue and random laid continuous filament web. 3,900,632, Cl. 428-196.000.

Rockwell International Corporation: *See—*
Maddox, James P., 3,899,815.
McCloskey, Albert R., 3,900,294.

Roddy, Joseph T.; and Begley, Russell D., to Emerson Electric Co. Die cast support having no effective draft. 3,900,234, Cl. 308-15.000.

Rode, John E., to Temper Corporation. Arrangement for preloading bearings. 3,900,232, Cl. 308-1.00R.

Rodrigues, Antonio A. Restraining device. 3,900,009, Cl. 119-96.000.

Rogers, Joan H.: *See—*
Dunbar, Joseph E.; and Rogers, Joan H., 3,900,471.

Rogers, R. Timothy, to Singer Company, The. Data communication system. 3,900,833, Cl. 340-147.00C.

Rohm and Haas Company: *See—*
Zdanowski, Richard E.; and Larsson, Bjorn E., 3,900,438.

Rohs, Ulrich. Sealing of cylinder head for an internal combustion engine. 3,899,880, Cl. 60-39.610.

Roland Offsetmaschinenfabrik Faber & Schleicher AG: *See—*
Theisz, Franz; Pollner, Max; and Holl, Roland, 3,900,193.

Rolker, John H.; and Carson, Bradley A., to Bell & Howell Company. Activation method for electroless plating. 3,900,320, Cl. 96-35.100.

Roller, Max F., to J. H. Channon, Inc. Roller curtain. 3,900,063, Cl. 160-310.000.

Roller, Siegfried; and Idler, Gustav, to C. Eugen Maier Metalverarbeitung GmbH. Spool changing device for spinning machines. 3,899,870, Cl. 57-53.000.

Rolls-Royce (1971) Limited: *See—*
Calder, Peter Henry; Gupta, Prem Chandra; and Lewis, William James, 3,900,177.
Hockley, Bernard Spencer, 3,899,921.
Rhodes, John Kenneth, 3,900,270.

Romano, Elazar, legal representative: *See—*
Seragnoli, Ariosto, deceased; and Romano, Elazar, legal representative, 3,899,863.

Romer, Rudolf: *See—*
Luther, Hans Werner; Romer, Rudolf; Winkelmann, Jurgen; and Rossmann, Winfried, 3,899,978.

Rongved, Paul I., to Activox, Inc. Process for total sewage treatment. 3,900,394, Cl. 210-7.000.

Rose, Andrew M., to Sperry Rand Corporation. Rotational speed monitor. 3,900,796, Cl. 324-161.000.

Rose, John Brewster: *See—*
Mathews, Carl Fraser; Nield, Eric; Rose, John Brewster; and Vincent, Peter Incledon, 3,900,531.

Rosinski, Klaus D.; and Schroer, John W., to Owens-Corning Fiberglas Corporation. Method for analysis of treated glass fibers. 3,900,584, Cl. 427-8.000.

Rossmann, Winfried: *See—*
Luther, Hans Werner; Romer, Rudolf; Winkelmann, Jurgen; and Rossmann, Winfried, 3,899,978.

Rostler, Fritz S., to Phillips Petroleum Company. Methods for modifying asphalts and emulsions useful therefor. 3,900,692, Cl. 428-489.000.

Roth, Herman P. Tub file. 3,900,157, Cl. 229-16.00D.

Rotterman, Robert: *See—*
Rottermann, Robert; and Fuchser, Fritz, 3,900,108.

Rottermann, Robert; and Fuchser, Fritz, to Rotterman, Robert. Display rack for carpets. 3,900,108, Cl. 211-46.000.

Rousseau, Gilbert James: *See—*
Stakic, Ratko; Buisson, Marc Francois Bernard; and Rousseau, Gilbert James, 3,899,883.

Roussel UCLAF: *See—*
Martel, Jacques; and Heymes, Rene, 3,900,468.

Rubino, Andrew M.: *See—*
Gilman, William S.; Jones, John L.; and Rubino, Andrew M., 3,900,620.

Ruda, Richard E.: *See—*
Korejwa, Alfred; Layer, Walter J.; and Ruda, Richard E., 3,900,545.

Rueckl, Roger L.: *See—*
Chao, Hung-Chi; Gross, John H.; Judd, Robert R.; and Rueckl, Roger L., 3,900,309.

Rummel, Werner, to Siemens Aktiengesellschaft. Method and device for the manufacture of catalytic layers for electrodes in electrochemical cells, particularly fuel cells. 3,900,602, Cl. 427-115.000.

Rumpf, Regis Robert; Farley, David Elmer; and Guilbault, Lawrence James, to Calgon Corporation. Water soluble block polymers used as silt control agents. 3,900,338, Cl. 134-22.00R.

Runyon, William L., Jr.: *See—*
Meader, Arthur L., Jr.; and Runyon, William L., Jr., 3,900,687.

Russ, Malcolm J., to Motorola, Inc. Scannable light emitting diode array and method. 3,899,826, Cl. 29-583.000.

Russell, Edwin T.: *See—*
Greaser, Sheridan H.; and Russell, Edwin T., 3,900,340.

Russell, Lowell L.; and Campbell, Claude E., to Teledyne McCormick Selph. Pyrotechnic actuated valve. 3,900,211, Cl. 280-150.0AB.

Russo, Andrew, Jr., to General Motors Corporation. Electronic modular package having a printed circuit assembly. 3,900,769, Cl. 317-101.0DH.

Russold, Maximilian; Scheck, Raimund; and Sidan, Heribert, to Steirische Gusstahlwerke Aktiengesellschaft. Spring assembly. 3,900,190, Cl. 267-9.00B.

Rutherford, Robert E., Jr.: *See—*
Glenn, William E., Jr.; and Rutherford, Robert E., Jr., 3,900,760.

Ruti Machinery Works Ltd.: *See—*
Strauss, Edgar, 3,900,050.

Rutkevich, Zinovy Yakovlevich: *See—*
Zabotin, Alexandr Alexandrovich; Onikov, Eduard Arshakovich; Galperin, Alexandr Lvovich; Loschilin, Evgeny Dmitrievich; Lileev, Valerian Petrovich; German, Roman Anatolievich; Rutkevich, Zinovy Yakovlevich; and Sakharov, Boris Alexandrovich, 3,900,049.

Ryan, Richard A., to Butterworth Manufacturing Company, Inc. Apparatus for uncurling selvedge. 3,899,808, Cl. 26-54.000.

Ryle, Bernard Groene: *See—*
Woolley, Harold Oakley, Jr.; and Ryle, Bernard Groene, 3,900,257.

Rynco Scientific Corporation: *See—*
Ivani, Edward J., 3,900,250.

Sack, John J.: *See—*
Lohr, Thomas E.; and Sack, John J., 3,900,210.

Sackoff, Martin M.; and Pulaski, Gregory F., to United Merchants and Manufacturers, Inc. Heat resistant laminate. 3,900,644, Cl. 428-40.000.

Sahara, Hajime: *See—*
Ono, Michakaze; Sahara, Hajime; and Akasaka, Masonori, 3,900,285.

St. Cyr, Lewis A.; and Young, Loren H., to Vulcan Materials Company. Prevention of air pollution by using activated alumina solid adsorbent to remove particulates of less than 0.5 microns from flue gases. 3,900,298, Cl. 55-71.000.

Saint-Gobain Industries: *See—*
Zanker, Paul, 3,899,858.

St. John, Daniel S., to Holotron Corporation. Holographic color television record system. 3,900,884, Cl. 358-2.000.

St. Mard, Hubert H.; Cooper, Albert S., Jr.; and Hamalainen, Carl, to United States of America, Agriculture. Flame retardant textiles by use of nitrogenous type resin and antimony oxide. 3,900,666, Cl. 428-290.000.

Sakaguchi, Seiichiro, to Hitachi, Ltd. Emergency cooling apparatus for reactors. 3,900,366, Cl. 176-37.000.

Sakamoto, Kenichi; and Kawamoto, Tamio, to Nissan Motor Co., Ltd. Rod controlled positive lock brake. 3,900,082, Cl. 188-69.000.

Sakharov, Boris Alexandrovich: *See—*
Zabotin, Alexandr Alexandrovich; Onikov, Eduard Arshakovich; Galperin, Alexandr Lvovich; Loschilin, Evgeny Dmitrievich; Lileev, Valerian Petrovich; German, Roman Anatolievich; Rutkevich, Zinovy Yakovlevich; and Sakharov, Boris Alexandrovich, 3,900,049.

Sakura, Hisaya: *See—*
Aishima, Itsuho; Fukuma, Noboru; Sakura, Hisaya; Chayamiti, Hiroshi; Okamoto, Toshio; Doi, Yuzuru; and Henmi, Hiroshi, 3,900,678.

Sakurada, Ichio: *See—*
Ito, Shunji; Morioka, Yasuaki; Kajinaga, Yoshihiro; Sakurada, Ichio; and Nitta, Minoru, 3,899,821.

Salbeck, Gerhard: *See—*
Horlein, Gerhard; Salbeck, Gerhard; and Emmel, Ludwig, 3,900,499.

Salomon, Georges Pierre Joseph. Safety ski binding. 3,900,206, Cl. 280-11.35E.

Salvo, George P., to International Business Machines Corporation. Interleaved memory control signal handling apparatus using pipelining techniques. 3,900,836, Cl. 340-172.500.

Samour, Carlos M.: *See—*
Ginger, Roger D.; and Samour, Carlos M., 3,900,474.

Sanchez, George R. Removable converter for a fishing pole with automatic release for fishing line. 3,899,846, Cl. 43-25.000.

Sandvik Aktiebolag: *See—*
Vogt, Udo Walter; and Waher, Sven G., 3,900,315.

Sano, Kazuya: *See—*
Komatsu, Noboru; Kamigaito, Osami; Suzuki, Takatoshi; Doi, Haruo; Sano, Kazuya; Yamamoto, Nobuyuki; Kandori, Toshio; and Tsuzuki, Yukikazu, 3,900,429.

Sanyo Electric Company, Ltd.: *See—*
Hirose, Kunio; and Mayeda, Akira, 3,900,893.

Sarem, Amir M., to Union Oil Company of California. Recovery of petroleum by flooding with viscous aqueous solutions of acrylamide-diacetone acrylamide copolymers. 3,900,069, Cl. 166-274.000.

Sargent Industries, Inc.: *See—*
Turner, Peter H., 3,900,408.

Sartori, Guido: *See—*
Valvassori, Alberto; Sartori, Guido; and Turba, Vittorio, 3,900,452.

Sartori, Rolland E., to Ateliers Roannais de Constructions Textiles. Apparatus for reciprocating a yarn guide. 3,900,166, Cl. 242-43.000.

Sasada, Juichi, to American Cyanamid Company. Process for reducing pilling tendencies of acrylic fibers and fiber products thereof. 3,900,618, Cl. 427-390.000.

Sasaki, Yositaka: *See—*
Shimada, Kazushi; Maeda, Toru; Nishizawa, Tamotu; Narisada, Takehiko; Anzai, Hisao; and Sasaki, Yositaka, 3,900,453.

Sato, Akihiro; Takeda, Saburo; Konotsune, Shiro; Kato, Mitsuru; and Tonoike, Takao, to Chisso Corporation. Method for polymerizing monomers comprising alpha-olefin. 3,900,454, Cl. 260-88.20R.

Sato, Katsuaki: *See—*
Enei, Hitoshi; Sato, Katsuaki; Anzai, Yasuo; and Okada, Hiroshi, 3,900,368.

Sato, Shui: *See—*
Fujimatsu, Wataru; Sato, Shui; Kojima, Tamotsu; Endo, Takaya; and Minahara, Kazumi, 3,900,483.

Sato, Tadashi; and Kubo, Shunichi, to Canon Kabushiki Kaisha. Liquid developing device for electrophotography. 3,900,003, Cl. 118-637.000.

Saucy, Gabriel, to Hoffmann-La Roche Inc. 1-(4-Isoxazolyl)-7-hydroxy-2-hydroxyimino heptanes. 3,900,491, Cl. 260-307.00H.

Sawyer, Willard H.: *See*—
Riley, Kenneth L.; and Sawyer, Willard H., 3,900,427.

Scardilli, Vincent; and Sessman, Arthur, to Bendix Corporation, The. Message tape for instrument display systems. 3,900,647, Cl. 428-67.000.

Schaefer, Donald L., to General Electric Company. Group III-V compound photoemitters having a high quantum efficiency and long wavelength response. 3,900,865, Cl. 357-30.000.

Schafer, James D.; and Pollman, Frederic W., to Sundstrand Corporation. Pipe coupling. 3,900,223, Cl. 285-4.000.

Schaffer, Edward W. Taping machine. 3,900,362, Cl. 156-577.000.

Schaller, Robert L., to Sundstrand Syracuse, Inc. High speed bar peeler. 3,899,943, Cl. 82-20.000.

Schapira, William H.: *See*—
Berkelhamer, Louis H.; and Schapira, William H., 3,900,818.

Schard, Malcolm P., to Mobil Oil Corporation. Thermoplastic films based on blends of polypropylene and polybutene. 3,900,534, Cl. 260-897.00A.

Schare, Walter G. Static charge resistant synthetic yarns. 3,900,624, Cl. 428-97.000.

Scheck, Raimund: *See*—
Russold, Maximilian; Scheck, Raimund; and Sidan, Heribert, 3,900,190.

Scheets, David F., to United States of America, Navy. FM-CW fuze system. 3,900,875, Cl. 343-7.0PF.

Scheier, Heinrich: *See*—
Bahler, Andre; Gschwend, Norbert; and Scheier, Heinrich, 3,899,796.

Scheinberg, Norman R.: *See*—
Hampel, Daniel; Prost, Kalman J.; and Scheinberg, Norman R., 3,900,742.

Schenk, Hanspeter; and Sigg-Grutter, Trudi, to Givaudan Corporation. Mercapto-butanone substituted cyclohexenes. 3,900,520, Cl. 260-586.00R.

Schepp, Horst: *See*—
Drawert, Manfred; Griebsch, Eugen; Krieger, Bernhard; Schepp, Horst; and Burba, Christian, 3,900,436.

Schering Aktiengesellschaft: *See*—
Drawert, Manfred; Griebsch, Eugen; Krieger, Bernhard; Schepp, Horst; and Burba, Christian, 3,900,436.

Scheuermann, Glen R.: *See*—
Kennedy, Kurt D.; and Scheuermann, Glen R., 3,900,592.

Schiessl, Alois, to Buck K. G., Firma. Demolition charges. 3,899,977, Cl. 102-90.000.

Schimmer, Rigobert: *See*—
Beerwerth, Wolfgang; Geppert, Albrecht; and Schimmer, Rigobert, 3,900,153.

Schlapfer, Hans; and Kabas, Guglielmo, to Ciba-Geigy Corporation. Benzofurans. 3,900,419, Cl. 252-301.20W.

Schlosser, James A.; and Trumbull, Walter A., to Dow Chemical Company, The. Sheet wrapper. 3,899,913, Cl. 72-383.000.

Schlumberger Technology Corporation: *See*—
Chevalier, Philippe; and Seeman, Bronislav, 3,900,731.
Davis, Billy W., 3,900,543.
Seeman, Bronislav, 3,900,733.
Trouiller, Jean Claude; and Lafont, Guy, 3,900,824.

Schmaldienst, Peter: *See*—
Haubner, Georg; Hofer, Walter; and Schmaldienst, Peter, 3,900,016.

Schmid, Wolfgang: *See*—
Diel, Peter J.; and Schmid, Wolfgang, 3,900,473.

Schmidt, Donald L.: *See*—
Lalk, Robert H.; Schmidt, Donald L.; and Thomas, Mary R., 3,900,619.

Schmidt, John C. Synthetic structure for covering a surface. 3,900,656, Cl. 428-215.000.

Schmidt, Peter-Jurgen: *See*—
Wahl, Josef; and Schmidt, Peter-Jurgen, 3,900,012.

Schneider, Eckart: *See*—
Heitmann, Knut; and Schneider, Eckart, 3,900,264.

Schneider, William P.: *See*—
Hamilton, Ramon D.; and Schneider, William P., 3,900,513.

Schnetger, Jochen: *See*—
Dietrich, Manfred; Schnetger, Jochen; Haas, Friedrich; Marwede, Gunter; and Appel, Hansgunter, 3,900,532.

Schnoller, Manfred: *See*—
Dietze, Wolfgang; Schnoller, Manfred; Mladenovich, Tomislav; and Baumgartner, Werner, 3,900,039.

Schoer, Heinz; and Schultze, Werner, to Vereinigte Aluminium-Werke Aktiengesellschaft. Joining process. 3,900,151, Cl. 228-220.000.

Schoffmann, Rudolf, to Allis-Chalmers Corporation. Apparatus for continuous casting a metal strand shaped to provide concave surfaces. 3,900,066, Cl. 164-282.000.

Scholz, William A. Cover for retail produce baskets. 3,900,129, Cl. 220-306.000.

Schonol, Karl: *See*—
Dierkes, Hubert; Schonol, Karl; Walter, Joachim; and Muller, Friedhelm, 3,900,608.

Schroer, John W.: *See*—
Rosinski, Klaus D.; and Schroer, John W., 3,900,584.

Schrom, Eike Karl: *See*—
Zukriegel, Hans; and Schrom, Eike Karl, 3,900,348.

Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See*—
Bystron, Bruno; Hoeber, W. Gerhard; and Goldammer, Georg, 3,899,949.

Schuck, Lee: *See*—
Larsen, Larry D.; Schuck, Lee; Pekarek, Joseph C.; and Mott, Richard C., 3,900,795.

Schultze, Werner: *See*—
Schoer, Heinz; and Schultze, Werner, 3,900,151.

Schulz, Arthur August, to Miles Laboratories, Inc. Meat emulsion extender process. 3,900,576, Cl. 426-311.000.

Schuman, Mark. Oscillating piston apparatus. 3,899,888, Cl. 60-519.000.

Schumperli, Max: *See*—
Bouvier, Pierre; and Schumperli, Max, 3,900,873.

Schwartzman, Morris: *See*—
Gunst, Dennis, 3,899,797.

Schwarz, Gunther, to Glasurit Werke M. Winkelmann GmbH. Process for the production of dimensionally stable, planar materials coated on one side. 3,900,690, Cl. 428-447.000.

Schwarz, Karl, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Sealing assembly in tank. 3,900,127, Cl. 220-216.000.

Schweicher, Wolfgang: *See*—
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Platz, Stephan; Friedsam, Josef; Schweicher, Wolfgang; Behr, Rolf; Wasser, Willi; and Browatzki, Kurt, 3,900,326.

Schwerdt, Friedrich W.: *See*—
Beck, Wolfgang; Brunner, Friedrich C.; Frasch, Peter U.; Ivancic, Blanka; Schwerdt, Friedrich W.; and Vogtmann, Theodor, 3,900,337.

Scott, Lyle B., to Byron Jackson, Inc. Stroke type drill stem tester. 3,900,068, Cl. 166-152.000.

Scott, William G.; Zickgraf, John H.; and Petron, Dennis A., to United States of America, Air Force. Conical unbalanced spiral radar modulator. 3,900,849, Cl. 343-18.00D.

Sebba, Felix. Microgas emulsions and method of forming same. 3,900,420, Cl. 252-307.000.

Sebenik, Roger Frank: *See*—
Terry, John Christopher; Lippman, Alfred; Sebenik, Roger Frank; and Harris, Harry Gordon, Jr., 3,900,312.

Sedlak, Vaclav: *See*—
Jurny, Josef; and Sedlak, Vaclav, 3,899,970.

Sedore, James W. Fibrillar locking system. 3,900,650, Cl. 428-86.000.

Seeburger, Thomas A., to Bethlehem Steel Corporation. Furnace seal. 3,900,282, Cl. 432-59.000.

Seegall, Manfred I.: *See*—
Compton, William A.; Duffy, Thomas E.; and Seegall, Manfred I., 3,899,878.

Seeman, Bronislav, to Schlumberger Technology Corporation. Methods and apparatus for measuring the density of geological formations. 3,900,733, Cl. 250-262.000.

Seeman, Bronislav: *See*—
Chevalier, Philippe; and Seeman, Bronislav, 3,900,731.

Seidman, Leon Louis. Detachable trough structure. 3,900,044, Cl. 137-360.000.

Seike, Helmut K., to Eltra Corporation. Converter for battery charger. 3,900,784, Cl. 320-6.000.

Seiko Koki Kabushiki Kaisha: *See*—
Kitai, Kiyoshi, 3,899,871.

Selch, Howard I., to Selch, James I.; Mullane, Joseph J.; and Copeland, T. D., part interest to each. Machine tool construction. 3,899,955, Cl. 90-11.00A.

Selch, James I.: *See*—
Selch, Howard I., 3,899,955.

Seleniz-Industrie Elettroniche Associate S.p.A.: *See*—
Caroli, Ignazio, 3,900,806.

Semper AB: *See*—
Turos, Sandor, 3,900,578.

Semperit AG: *See*—
Gluck, Maternus; Eder, Bernhard; and Kriegner, Walter, 3,899,850.

Sener, Tecnica Industrial y Naval, S.A.: *See*—
Menendez, Jaime Torroja, 3,899,988.

Seng, Florin; Ley, Kurt; and Metzger, Georg, to Bayer Aktiengesellschaft. Antibacterial compositions and methods. 3,900,562, Cl. 424-248.000.

Senour, Donald A.: *See*—
Lage, David A.; and Senour, Donald A., 3,900,828.

Sentoku, Hideshi: *See*—
Uchida, Isamu; Watanabe, Kenkichi; and Sentoku, Hideshi, 3,899,864.

Seragnoli, Ariosto, deceased; and by Romano, Elazar, legal representative, to G. D. Societa in Accomandita Semplice di Enzo Seragnoli e Ariosto Seragnoli. Apparatus for the exiting of products, particularly packets of cigarettes and similar, from a wrapping packing line for the said products. 3,899,863, Cl. 53-53.000.

Serizawa, Akio, to Sony Corporation. Tape cassette. 3,900,170, Cl. 242-198.000.

Serizawa, Akio, to Sony Corporation. Tape cassette. 3,900,171, Cl. 242-198.000.

Serizawa, Hiroyuki: *See*—
Fukai, Masakazu; Fujiwara, Shinji; Serizawa, Hiroyuki; Eguchi, Osamaru; Kuramoto, Yukimasa; and Chikamura, Takao, 3,900,882.

Sermanet, Gerard, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Coupling device for fluids and its application to the measurement of levels and the storage of liquids. 3,899,930, Cl. 73-299.000.

Serra, John J.: *See—*
Casey, Richard C.; Duggan, Robert J.; Grosky, Stephen A.; Jen, Dixson Teh-Chao; Serra, John J.; Whitehead, Donald Shaffer; and Boyce, Thomas E., 3,900,834.

Sessman, Arthur: *See—*
Scardilli, Vincent; and Sessman, Arthur, 3,900,647.

Seufert, Wilhelm, to Werner & Pfleiderer. Screw extruder housing with a wear-resistant lining. 3,900,188, Cl. 259-192.000.

Seward, Harold H. System for counting pills and the like. 3,900,718, Cl. 235-150.510.

Shammas, Antoine. Jewelry bag. 3,900,060, Cl. 150-52.00R.

Sharp, Herbert John: *See—*
Hart, Frederick Leslie; and Sharp, Herbert John, 3,900,649.

Sharp, James H.: *See—*
Lindblad, Nero R.; Johnson, Gordon E.; and Sharp, James H., 3,900,589.

Sheer, Charles; Korman, Samuel; Angier, Derek J.; and Cahn, Robert P., to Sheer-Korman Associates, Inc. Method and apparatus for projecting materials into an arc discharge. 3,900,762, Cl. 315-111.000.

Sheer-Korman Associates, Inc.: *See—*
Sheer, Charles; Korman, Samuel; Angier, Derek J.; and Cahn, Robert P., 3,900,762.

Sheesley, Wilmer Lee; and Pauza, William Vito, to AMP Incorporated. Multiple switch assembly having independent operators rotatably cumming discrete leaf spring type contact assemblies. 3,900,709, Cl. 200-5.00R.

Shell Oil Company: *See—*
de Jong, Lodewikus N. J., 3,900,226.

Shenk, Wilbur, III: *See—*
Isham, Allan B.; and Shenk, Wilbur, III, 3,900,048.

Shepherd, Glen C.: *See—*
Blanton, Bobby D.; and Shepherd, Glen C., 3,899,895.

Shibata, Takayuki: *See—*
Ishikawa, Katsukiyo; and Shibata, Takayuki, 3,900,126.

Shibuya, Takehiro: *See—*
Moriguchi, Toshiro; Miwa, Kiyoshi; and Shibuya, Takehiro, 3,900,330.

Shichman, Daniel: *See—*
Neville, James J.; Ferrell, Wesley; and Shichman, Daniel, 3,900,062.

Shimada, Kazushi; Maeda, Toru; Nishizawa, Tamotu; Narisada, Takehiko; Anzai, Hisao; and Sasaki, Yositaka, to Mitsubishi Rayon Co., Ltd. Process for the production of methacrylate polymer molding materials. 3,900,453, Cl. 260-86.10E.

Shimizu, Mitsuhiro: *See—*
Suzuki, Tadayuki; Wada, Jin; Miyamatsu, Hiroki; Ueno, Shinji; and Shimizu, Mitsuhiro, 3,900,486.

Shinohara, Toshio: *See—*
Makishima, Hiroshi; Shinohara, Toshio; Kawahara, Yukio; Nii, Hiroshi; and Ebine, Setsuo, 3,900,630.

Shipley Company, Inc.: *See—*
Christensen, Carl W.; and Isaacson, Calvin M., 3,900,325.

Shneider, Aaron H. Card pocket supporting means. 3,899,842, Cl. 40-104.180.

Shockley, Walter I., Jr. Containerized cage system for chickens. 3,900,006, Cl. 119-18.000.

Shogren, David K.: *See—*
Hoppner, Werner F.; and Shogren, David K., 3,900,258.

Shoichiro, Ito; Ohya, Tokuzi; and Nagai, Shozi, to Yuasa Battery Company Limited. Storage battery and process for producing the battery. 3,900,341, Cl. 136-54.000.

Shutt, Philip R.: *See—*
Hoft, Donald J.; and Shutt, Philip R., 3,900,799.

Sidan, Heribert: *See—*
Russold, Maximilian; Scheck, Raimund; and Sidan, Heribert, 3,900,190.

Sidcor, Inc.: *See—*
Clare, Michael A., 3,900,087.

Siemens Aktiengesellschaft: *See—*
Albrecht, Cord; and Lamatsch, Hans, 3,900,702.
Behn, Reinhard; and Hoyler, Gerhard, 3,900,788.
Bendel, Hermann, 3,900,708.
Dietze, Wolfgang; Schnoller, Manfred; Mladenovich, Tomislav; and Baumgartner, Werner, 3,900,039.
Hohne, Karl; and Bogusch, Renate, 3,900,342.
Kleen, Gerhard; and Herrmann, Albert, 3,900,791.
Kullmann, Dieter; and Marsing, Helmut, 3,900,809.
Lauterbach, Richard, 3,900,639.
Moltgen, Gottfried, 3,900,792.
Penczynksi, Peter; Matthaus, Gunther; Massek, Peter; and Liendl, Johann, 3,900,699.
Rittmayer, Gerhard; Renner, Theodor; Grubmuller, Georg; and Falkenberg, Dieter, 3,900,603.
Rummel, Werner, 3,900,602.
Wagner, Gerhard, 3,900,867.

Siepermann, Walter: *See—*
Koch, Friedhelm; and Siepermann, Walter, 3,899,965.

Siepmann, Reiner: *See—*
Mai, Gerhard; Siepmann, Reiner; and Kummer, Franz, 3,900,428.

Sigg-Grutter, Trudi: *See—*
Schenk, Hanspeter; and Sigg-Grutter, Trudi, 3,900,520.

Signetics Corporation: *See—*
Knubbe, Keith; Hoeft, Werner H.; and Kelson, Gary, 3,900,821.

Signode Corporation: *See—*
Tremper, Donald R., 3,899,963.

Sih, Charles J., to Wisconsin Alumni Research Foundation. 2-(6-Carbomethoxy-cis-2-hexenyl)-4(R)-hydroxy-2-cyclopenten-1-one and method for preparing same. 3,900,512, Cl. 260-468.00K.

Siletto, Giorgio: *See—*
Ravera, Giovanni; Siletto, Giorgio; and Bellis, Carlo, 3,900,256.

Silfvast, William Thomas; and Wood II, Obert Reeves, to Bell Telephone Laboratories, Incorporated. Lasers optically pumped by laser-produced plasma. 3,900,803, Cl. 331-94.50P.

Sim, James S. Y.; Van Horn, Maurice H.; Cohen, Arthur I.; Gordesky, Stanley E.; and Gordon, Stanley I., to Union Corporation. Sustained release of methantheline. 3,900,559, Cl. 424-22.000.

Simomura, Kazuhisa: *See—*
Irie, Sadanao; Tomomoto, Kenichi; Akahori, Toyohiko; and Simomura, Kazuhisa, 3,900,369.

Simons, Charles W.: *See—*
Holdsworth, Robert S.; O'Neill, Gerald J.; Simons, Charles W.; and DiBiasio, Vincent L., 3,900,568.

Simpson, Melvyn I.: *See—*
Kallianos, Andrew G.; Warfield, Albert H.; and Simpson, Melvyn I., 3,900,521.

Sincock, Thomas F., to Monsanto Company. Preforms for forming pressurized containers. 3,900,120, Cl. 215-1.00C.

Singer Company, The: *See—*
Batson, William A., 3,899,852.
Ferriss, Lincoln S., 3,900,843.
Lewinter, Sidney W., 3,900,879.
Rogers, R. Timothy, 3,900,833.

Sittmann, Brigitte, to Vereinigte Baubeschlagfabriken Gretsch & Co. GmbH. Ski safety binding. 3,900,205, Cl. 280-11.35K.

Sjoberg, Borje Gustav; Odman, Rolf Ragnar; Belstad, Arne; and Lofgren, Nils Clov Allan, to Luossavaara-Kiirumavaara AB. Controlling admixture of aqueous liquid to ball rolling of powdery iron ore. 3,900,293, Cl. 23-313.000.

Skaletzky, Louis L.: *See—*
Renis, Harold E.; and Skaletzky, Louis L., 3,900,476.

Skinner, Dennis E.: *See—*
Davies, John; and Skinner, Dennis E., 3,899,998.

Skulley, Gerald W.: *See—*
Houseman, Henry J.; and Skulley, Gerald W., 3,900,831.

Slimp, Jack B., Jr. Apparatus for indicating wind directions and velocity. 3,899,929, Cl. 73-189.000.

Sloan Valve Company: *See—*
Billeter, Henry R., 3,900,086.

Smiley, Eldridge H.: *See—*
Storm, Fred K.; and Smiley, Eldridge H., 3,899,829.

Smith, Charles E.; Hink, Karl M.; Greening, Donald J., deceased; and by Greening, Dorothy, executrix, to Cutler-Hammer, Inc. Motor speed control system with timed speed reference clamp and speed error spill-through circuit. 3,900,781, Cl. 318-271.000.

Smith, Duane R.; and Anderson, Rodney H., to Caterpillar Tractor Company. Brake control arrangement for skidders. 3,900,227, Cl. 303-7.000.

Smith, Fenter Willie. Automatic animal food dispenser. 3,900,007, Cl. 119-51.130.

Smith, Imre Jack. Space filling material and method. 3,900,648, Cl. 428-71.000.

Smith, Peter S.; and Theurer, Richard B., to Massachusetts Machine Shop Inc. Lamp shade center. 3,900,729, Cl. 240-136.000.

Smith, Ronald. Skirting boards and facia covers therefor. 3,899,859, Cl. 52-287.000.

Smolin, Edwin M.: *See—*
Barabas, Eugene S.; and Smolin, Edwin M., 3,900,663.

Snam Progetti S.p.A.: *See—*
Fattore, Vittorio; Moreschini, Paolo; and Notari, Bruno, 3,900,426.

Societa Anonyme Poclain: *See—*
Bourges, Bernard M., 3,900,113.

Societe Anonyme: Banque pour l'Expansion Industrielle "Banexi": *See—*
Fusey, Pierre, 3,900,421.

Societe Anonyme dite: Omnium de Prospective Industrielle S.A.: *See—*
Lapierre, Philippe D., 3,899,903.

Societe Anonyme: Glaenzer Spicer: *See—*
Orain, Michel, 3,899,912.

Societe d'Applications des Machines Motrices: *See—*
Bricout, Henri, deceased; Bricout, Marie, heir; Bricout, Didier, heir; Bricout, Catherine, heir; and Bricout, Veronique, heir, 3,900,137.

Societe Nationale des Poudres et Explosifs: *See—*
Brocart, Alain, 3,899,973.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Stakic, Ratko; Buisson, Marc Francois Bernard; and Rousseau, Gilbert James, 3,899,883.

Societe Nationale Industrielle Aerospatiale: *See—*
Alric, Andre; Carlet, Xavier; Nozeran, Robert; and Gentet, Pierre, 3,900,785.

Soga, Hiromu; Minamida, Katsuhiro; Kurasawa, Kazuo; and Ii, Masatake, to Nippon Steel Corporation; and Hamamatsu TV Co., Ltd. Method of simultaneous multiplex recording of picture and data and of regenerating such record and apparatus therefor. 3,900,887, Cl. 360-18.000.

Sokal, Alan D.: *See—*
Sokal, Nathan O.; and Sokal, Alan D., 3,900,823.

Sokal, Nathan O.; and Sokal, Alan D. Amplifying and processing apparatus for modulated carrier signals. 3,900,823, Cl. 330-149.000.

Sollman, Kenneth John: *See—*
Bowen, James Harold; and Sollman, Kenneth John, 3,900,043.

Somov, Boris Stepanovich; Mamin, Alexandr Ilich; Novikov, Andrei Porfirievich; Filippov, Vyacheslav Ivanovich; Khirdzhiev, Sergei Grigorievich; Gurevich, Vladimir Zakharovich; Voronov, Nikolai Stefanovich; and Agafonov, Ivan Fedorovich. Device for bending pipes with simultaneous upsetting. 3,899,908, Cl. 72-28.000.

Sonnak Batterier A/S: *See—*
Bergh, Gunnar; Brass, Kjell; Hessner, Jorgen; and Varberg, Thomas, 3,900,343.

Sony Corporation: *See—*
Furuno, Hiroshi, 3,900,801.
Kamaya, Naoki, 3,900,172.
Ohsawa, Mitsuo, 3,900,790.
Serizawa, Akio, 3,900,170.
Serizawa, Akio, 3,900,171.
Yamazaki, Hiroshi; and Ando, Tetsuo, 3,900,747.

Soroka, John, to J & S Aluminum Inc. Hanger. 3,900,110, Cl. 211-113.000.

Sovish, Richard C.; Sullivan, Michael B.; and Wetmore, Judson D., to Raychem Corporation. Heat recoverable articles and method of making same. 3,899,807, Cl. 24-255.00C.

Spanco Yarns, Inc.: *See—*
Northup, Francis B.; and Hart, Donald R., 3,899,867.

Sparks, Bryan D.: *See—*
Meadus, Frederick W.; Sparks, Bryan D.; and Puddington, Ira E., 3,900,317.

Spaulding, Edward C., to International Business Machines Corporation. Paraxylylene-silane dielectric films. 3,900,600, Cl. 427-99.000.

Spehrley, Charles W., to Joy Manufacturing Company. Expanding valves for electrostatic precipitators and the like. 3,900,299, Cl. 55-133.000.

Speiser, Jeffrey M.; and Whitehouse, Harper John, to United States of America, Navy. Serial-access linear transform. 3,900,721, Cl. 235-156.000.

Spencer, Andrew R., to Bendix Corporation, The. Porous laminate and method of manufacture. 3,900,629, Cl. 428-136.000.

Spencer, Kenneth Morgan, to Newage Engineers Limited. Fluid-pressure rotary machines. 3,899,958, Cl. 91-492.000.

Speno, Martin J.; and Bruno, Anthony T., to Frank Speno Railroad Ballast Cleaning Company, Inc. Ballast cleaner. 3,900,392, Cl. 209-241.000.

Sperry Rand Corporation: *See—*
Bock, Joseph J.; and Dunham, William S., 3,900,868.
Eibner, Jules A., 3,900,890.
McDevitt, Bernard J., 3,899,968.
Mears, William E., 3,900,848.
Rose, Andrew M., 3,900,796.

Spurrier, Mack W.: *See—*
Clifford, Graham F.; and Spurrier, Mack W., 3,899,817.

Squire, William D.: *See—*
Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., 3,900,827.

Staab, Norbert A.: *See—*
Castaneda, Ben; and Staab, Norbert A., 3,899,818.

Stache, Ulrich: *See—*
Radscheit, Kurt; Stache, Ulrich; Fritsch, Werner; and Haede, Werner, 3,900,502.

Stahl-Urban Company: *See—*
Conner, William R., Jr., 3,899,986.

Stakic, Ratko; Buisson, Marc Francois Bernard; and Rousseau, Gilbert James, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. After burner. 3,899,883, Cl. 60-39.710.

Stange, Klaus K., to Xerox Corporation. Donor apparatus. 3,900,002, Cl. 118-637.000.

Stanley, Leonard A.; and Fouche, Glynn E., Jr., to Kendall Company, The. Method of making chemically protected off-the-loom fabrics. 3,899,810, Cl. 28-72.600.

Statni vyzkumny ustav kozedelny: *See—*
Muck, Eduard; Strachota, Jaroslav; and Horak, Josef, 3,900,621.

Stauffer Chemical Company: *See—*
Henry, Allan L., 3,900,055.
Kraft, Paul; and Jin, Jung Il, 3,900,455.
Weil, Edward D., 3,900,665.

Steele, Ernest R., to United States of America, General Counsel-Code GP. Satellite aided vehicle avoidance system. 3,900,847, Cl. 343-6.50R.

Steetley (Mfg.) Limited: *See—*
Randle, Raymond Thomas; Williamson, John; and Wilson, David, 3,900,403.

Steigelman, James Q., to W. M. Chace Company. Bilayer metallic article. 3,900,295, Cl. 29-196.300.

Steirische Gusstahlwerke Aktiengesellschaft: *See—*
Russold, Maximilian; Scheck, Raimund; and Sidan, Heribert, 3,900,190.

Stempeck, John W., to Polaroid Corporation. Exposure control system and method. 3,900,855, Cl. 354-29.000.

Stenlund, Hans, to Gotaverken Angteknik AB. Air supply means for a furnace. 3,900,011, Cl. 122-235.00B.

Stepanjuk, Georgy Pavlovich: *See—*
Privalov, Petr Leonidovich; Makurin, Pavel Semenovich; Plotnikov, Valerian Valerievich; Koryagin, Vladimir Vasilievich; Polpudnikov, Viktor Sergeevich; and Stepanjuk, Georgy Pavlovich, 3,899,918.

Stephens, James B., to Westates Space-Era Products, Inc. Liquid distribution systems. 3,900,135, Cl. 222-52.000.

Sterling Drug Inc.: *See—*
Dickinson, William B.; and Vaupotic, Marcia P., 3,900,480.

Sternbach, Leo Henryk: *See—*
Ning, Robert Ye-Fong; and Sternbach, Leo Henryk, 3,900,501.

Stevens, Harold E., to Coaxial Dynamics. Directional coupler for transmission lines. 3,900,805, Cl. 333-10.000.

Stevens, Robert W.: *See—*
Coyle, Jan R.; and Stevens, Robert W., 3,900,886.

Stewart, John Hill: *See—*
Dyott, Richard Burnaby; and Stewart, John Hill, 3,900,245.

Stewart, William E., to Linatex Corporation of America. Pretensioned screen panel. 3,900,628, Cl. 428-134.000.

Stickney, William A.: *See—*
Hunter, Willard L.; White, Jack C.; and Stickney, William A., 3,900,552.

Stigler, Edward A., to Christensen, Walter M., a part interest. Fermentation adjuvant for yeast leavened bread processes. 3,900,570, Cl. 426-9.000.

Stinger, Henry Joseph, to du Pont de Nemours, E. I., and Company. Composite polymeric electric heating element. 3,900,654, Cl. 428-214.000.

Stiteler, Fred Zwald; and Honigmann, Ronald Louis, to Combustion Engineering, Inc. Method and apparatus for reverse circulating nuclear steam generator secondary fluid. 3,900,010, Cl. 122-32.000.

Stoll, Max: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,900,581.
Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., 3,900,582.

Storm, Fred K.; and Smiley, Eldridge H., to Fred Storm Industrial Designs, Inc. Holder and actuator means for surgical instruments. 3,899,829, Cl. 30-228.000.

Strachota, Jaroslav: *See—*
Muck, Eduard; Strachota, Jaroslav; and Horak, Josef, 3,900,621.

Strathdee, Graeme Gilroy, to Atomic Energy of Canada Limited. Anchored homogeneous-type catalysts for H-D exchange. 3,900,557, Cl. 423-580.000.

Strauss, Edgar, to Ruti Machinery Works Ltd. Reed dent arrangement. 3,900,050, Cl. 139-12.000.

Strenkowski, John: *See—*
Gibbon, John; Heacock, Burt; Lipnick, Richard; Strenkowski, John; and Tutino, Matthew, 3,900,846.

Subsea Equipment Associates Limited: *See—*
Liautaud, Jean A., 3,899,894.

SuCrest Corporation: *See—*
Monti, Anthony, 3,900,569.

Suga, Shigeru. Long-life carbon electrodes for weather tester and the like. 3,900,756, Cl. 313-354.000.

Sugaya, Hiroshi; and Hosono, Hiroo, to Matsushita Electric Industrial Co., Ltd. Magnetic video recording and reproducing apparatus. 3,900,892, Cl. 360-85.000.

Sugiyama, Masatoshi: *See—*
Tada, Sugihiko; Nishigaki, Yasuo; and Sugiyama, Masatoshi, 3,900,523.

Sulkowski, Theodore S., to American Home Products Corporation. Tetrahydropyrimidinyl phenyl carbonyl acid addition salts, imidazolinyl phenyl carbonyl compounds acid addition salts and related compounds. 3,900,494, Cl. 260-296.00T.

Sullivan, Michael B.: *See—*
Sovish, Richard C.; Sullivan, Michael B.; and Wetmore, Judson D., 3,899,807.

Sullivan, Robert E.: *See—*
Arvin, John R.; Sullivan, Robert E.; Troth, Dennis L.; and Verdouw, Albert J., 3,899,881.

Sulzer Brothers Limited: *See—*
Bahler, Andre; Gschwend, Norbert; and Scheier, Heinrich, 3,899,796.
Bucher, Robert, 3,900,051.

Sumi, Hirotaka; Suzuki, Isao; Yokoe, Isamu; and Matsuzaki, Tetsuo, to Toyoda Koki Kabushiki Kaisha. Feed control apparatus for a grinding machine. 3,900,777, Cl. 318-39.000.

Sun Research and Development Co.: *See—*
Turner, John O., 3,900,489.

Sun Spice Co., Ltd.: *See—*
Masuda, Yoshikazu; and Inagaki, Tatsumi, 3,900,579.

Sunagawa, Mitsuru: *See—*
Tsukada, Kazuo; Sunagawa, Mitsuru; and Kanzaki, Yoshiharu, 3,900,876.

Sundstrand Corporation: *See—*
Schafer, James D.; and Pollman, Frederic W., 3,900,223.

Sundstrand Syracuse, Inc.: *See—*
Schaller, Robert L., 3,899,943.

Super 8 Sound, Inc.: *See—*
Doyle, Robert O.; Kirsch, Jordan; and Thomis, Wendl, 3,900,251.

Susa, Kenzo: *See—*
Kobayashi, Toshio; Susa, Kenzo; and Taniguchi, Satoshi, 3,900,431.

Suttner, Thomas John. Sound effect toy game combination. 3,900,196, Cl. 273-1.00R.

Suzuki, Isao: *See—*
Sumi, Hirotaka; Suzuki, Isao; Yokoe, Isamu; and Matsuzaki, Tetsuo, 3,900,777.

Suzuki, Tadayuki; Wada, Jin; Miyamatsu, Hiroki; Ueno, Shinji; and Shimizu, Mitsuhiro, to Tokyo Tanabe Company, Ltd. 3-Methyl-2-phenyl-5-benzothiazoline acetic acid compounds and process for producing the same. 3,900,486, Cl. 260-304.000.

Suzuki, Takatoshi: *See—*
Komatsu, Noboru; Kamigaito, Osami; Suzuki, Takatoshi; Doi, Haruo; Sano, Kazuya; Yamamoto, Nobuyuki; Kandori, Toshio; and Tsuzuki, Yukikazu, 3,900,429.

Svarz, Jerry J., to Nalco Chemical Company. Conversion of nitrile to its corresponding amide using improved copper oxide catalyst. 3,900,517, Cl. 260-561.00N.

Svensson, Lennart: *See—*
Elmgren, Staffan; and Svensson, Lennart, 3,900,189.

Svischev, Georgy Petrovich: *See—*
Tupolev, Andrei Nikolaevich; Tupolev, Alexei Andreevich; Minkner, Kurt Vladimirovich; Bonin, Alexandr Romanovich; Cheremukhin, Georgy Alexeevich; Bliznjuk, Valentin Ivanovich; Pukhov, Alexandr Leonidovich; Svischev, Georgy Petrovich; Bjushgens, Georgy Sergeevich; Nikolaev, Alexandr Vasilievich; and Mikeladze, Vitaly Georgievich, 3,900,178.

Swain, Allan L.: *See—*
Tallent, Michael W.; Hendershot, William B.; Swain, Allan L.; and Harrison, Ronnie M., 3,900,885.

Swanson, Kenneth B.; and Huffman, Herman M., to Midland-Ross Corporation. Pedal ratio control for hydraulic booster. 3,899,889, Cl. 60-547.000.

Swanson, Kenneth B., to Midland-Ross Corporation. Warning device for brake systems and the like. 3,900,840, Cl. 340-242.000.

Swezy, Montgomery C.: *See—*
Doyle, Robert L.; and Swezy, Montgomery C., 3,899,843.

Swick, Robert M., to General Motors Corporation. Gas turbine engine control. 3,899,886, Cl. 60-223.000.

Swiss Aluminum Ltd.: *See—*
Chaudhuri, Kiranendu B., 3,900,371.

Syracuse University Research Corporation: *See—*
Howells, Paul W., 3,899,960.

Tabler, Donald C.: *See—*
Johnson, Marvin M.; Tabler, Donald C.; and Nowack, Gerhard P., 3,900,526.

Tackett, James E., Jr.: *See—*
Kersch, Keith M.; Pouska, George A.; Drayer, Dennis E.; and Tackett, James E., Jr., 3,900,041.

Tada, Sugihiko; Nishigaki, Yasuo; and Sugiyama, Masatoshi, to Fuji Photo Film Co., Ltd. Method for purifying hydroquinone as well as method for purifying and recovering hydroquinone. 3,900,523, Cl. 260-621.00A.

Tagaya, Ryosaku: *See—*
Takahashi, Toshio; Tagaya, Ryosaku; and Ehara, Toshiyasu, 3,900,266.

Taguchi, Naoyoshi. Element for detection of combustible gases and smoke. 3,900,815, Cl. 338-34.000.

Taguchi, Tatsuya; and Iura, Yukio, to Canon Kabushiki Kaisha. Automatic exposure control device. 3,900,856, Cl. 354-45.000.

Takacs, John: *See—*
Bucy, Shawn G.; and Takacs, John, 3,900,851.

Takada, Tadamichi: *See—*
Inoue, Shohei; Kanbe, Masaki; Takada, Tadamichi; Miyazaki, Nobuyuki; and Yokokawa, Masanori, 3,900,424.

Takagaki, Takashi: *See—*
Mukogawa, Masashi; and Takagaki, Takashi, 3,900,351.

Takahashi, Isao: *See—*
Tanji, Mikiharu; Yamanaka, Yoshimasa; and Takahashi, Isao, 3,900,764.

Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, to Nissan Motor Co., Ltd. Universal joint. 3,899,898, Cl. 64-21.000.

Takahashi, Toshio; Tagaya, Ryosaku; and Ehara, Toshiyasu, to Eisai Co., Ltd. Method and apparatus for detecting solid substances contained in liquid. 3,900,266, Cl. 356-208.000.

Takami, Norihiko; Hattori, Osamu; and Wakabayashi, Manabu, to Hitachi, Ltd. Method of manufacturing pole piece assembly for electromagnetic type pickup. 3,899,827, Cl. 29-603.000.

Takashima, Kazushige; Nishigaki, Katumi; and Yamashita, Terumasa, to Matsushita Electric Industrial Co., Ltd. Metallized film capacitor. 3,900,775, Cl. 317-258.000.

Takeda Chemical Industries, Ltd.: *See—*
Komatani, Taro; Yamada, Kazuo; Oguri, Eizo; and Tokuda, Yasunori, 3,900,462.
Kuwada, Yutaka; Natsugari, Hideaki; and Meguro, Kanji, 3,900,490.

Takeda, Saburo: *See—*
Sato, Akihiro; Takeda, Saburo; Konotsune, Shiro; Kato, Mitsuru; and Tonoike, Takao, 3,900,454.

Takeshita, Tsuneichi, to du Pont de Nemours, E. I., and Company. Hydroxyl-terminated chloroprene polymers. 3,900,379, Cl. 204-159.240.

Takiguchi, Hisashi: *See—*
Masuda, Noboru; and Takiguchi, Hisashi, 3,900,813.

Takvoryan, Nurhan E.: *See—*
Bard, Allen J.; and Takvoryan, Nurhan E., 3,900,418.

Tallent, Michael W.; Hendershot, William B.; Swain, Allan L.; and Harrison, Ronnie M., to Consolidated Video Systems. Television signal time base corrector. 3,900,885, Cl. 358-8.000.

Tanabe, Koji, to Citizen Watch Co., Ltd. Driving circuits for electrical printers. 3,900,095, Cl. 197-1.00R.

Tanabe, Takashi; and Adachi, Tomio, to Teitin Ltd. Method for producing a magnetic recording material. 3,900,604, Cl. 427-129.000.

Tanaka, Masaru: *See—*
Oku, Takeshi; and Tanaka, Masaru, 3,900,745.

Tanck, Elinor J.; Hulse, Lauren L.; and Kelly, Paul P., to Memorex Corporation. Electrophotographic developer. 3,900,414, Cl. 252-62.10P.

Tanguy, Pierre J., to Etud S.A. Portable cooking appliance. 3,899,961, Cl. 99-340.000.

Taniguchi, Satoshi: *See—*
Kobayashi, Toshio; Susa, Kenzo; and Taniguchi, Satoshi, 3,900,431.

Tanikoshi, Kinzi, to Canon Kabushiki Kaisha; and Canon Seiki Kabushiki Kaisha. Control circuit for electric motors. 3,900,780, Cl. 318-254.000.

Tanji, Mikiharu; Yamanaka, Yoshimasa; and Takahashi, Isao. Cathode ray tubes for displaying letters and the like. 3,900,764, Cl. 315-21.00R.

Taplin Business Machines Incorporated: *See—*
Hanchett, Leland J., 3,900,832.

Taruntaev, Vladimir, to VSI Automation Assembly, Inc. Tool head assembly for imparting rotary rocking motion to a tool. 3,899,909, Cl. 72-112.000.

Tate, Donald P.: *See—*
Bethany, Lewis R.; Desmonds, Daniel J.; and Tate, Donald P., 3,900,723.

Taub, Bernard; and Harnish, Daniel F., to Allied Chemical Corporation. Expandable polystyrene beads. 3,900,433, Cl. 260-2.50B.

Taylor, Allen L., to Minnesota Mining and Manufacturing Company. Printing using pyroelectric film. 3,899,969, Cl. 101-130.000.

Taylor, Lynn J., to Owens-Illinois, Inc. Preparation of chemically convertible tape. 3,900,682, Cl. 427-386.000.

Teel, Paul H.: *See—*
Christmann, Harold F.; and Teel, Paul H., 3,900,525.

Teitin Ltd.: *See—*
Tanabe, Takashi; and Adachi, Tomio, 3,900,604.

Tektronix Inc.: *See—*
Holland, Kenneth C., 3,900,711.
White, Robert Gordon, 3,900,853.

Tele-Vend Systems: *See—*
Bednar, John P.; and Weaver, Harvey N., 3,900,093.

Teledyne, Inc.: *See—*
Wiesler, Mordechai; and McCarron, John C., 3,900,244.

Teledyne McCormick Selph: *See—*
Russell, Lowell L.; and Campbell, Claude E., 3,900,211.

Teledyne Mid-America Corporation: *See—*
Darlington, Henry S., 3,900,123.

Teller, Aaron J., to Teller Environmental Systems, Inc. Test process and apparatus for treatment of jet engine exhaust. 3,899,923, Cl. 73-116.000.

Teller Environmental Systems, Inc.: *See—*
Teller, Aaron J., 3,899,923.

Temper Corporation: *See—*
Rode, John E., 3,900,232.

Tension Structures Co.: *See—*
Huddle, Carl F., 3,899,854.

Terajima, Kazuki; Tomita, Shigeru; Matsuda, Yoshindo; and Abe, Keiji, to Director-General of the Agency of Industrial Science and Technology. Heavy metal adsorbents and process for producing same. 3,900,422, Cl. 252-426.000.

Teraoka, Kohta; and Nakano, Toshio, to Nippon Columbia Kabushiki Kaisha. Method of making crystal. 3,900,363, Cl. 156-612.000.

Terlecki, Leo: *See—*
Goulish, Gabriel J.; Terlecki, Leo; and Wright, Alan R., 3,900,236.

Terry, David R., to American Home Products Corporation. Contoured belt coating method. 3,900,583, Cl. 427-3.000.

Terry, John Christopher; Lippman, Alfred; Sebenik, Roger Frank; and Harris, Harry Gordon, Jr., to Toth Aluminum Corporation. Reduction of aluminum chloride by manganese. 3,900,312, Cl. 75-68.00B.

Tetra Pak Development SA: *See—*
Rausing, Hans A.; Olsen, Jan-Erik; and Rauser, Jan Axel Ingemar, 3,900,155.

Texaco Inc.: *See—*
Dowling, Donald J.; and Boyd, John F., 3,900,826.
Hinnant, Harris O., 3,900,825.

Texas Instruments Incorporated: *See—*
Baboian, Robert, 3,900,375.
Blanton, Bobby D.; and Shepherd, Glen C., 3,899,895.
Bryant, Samuel T., 3,899,896.
Cochran, Michael J.; and Grant, Charles P., Jr., 3,900,722.
Grenier, Aime J., 3,900,810.

Texcone Limited: *See—*
Hamilton, Arthur C., 3,900,168.

Thayer, William Stansbury: *See—*
Garrett, Clyde Barner; and Thayer, William Stansbury, 3,899,945.

Theisz, Franz; Pollner, Max; and Holl, Roland, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Take-off grippers in printing presses. 3,900,193, Cl. 271-85.000.

Theurer, Richard B.: *See—*
Smith, Peter S.; and Theurer, Richard B., 3,900,729.

Thoma, Wilhelm; Noll, Klaus; Pedain, Josef; and Koch, Hans Joachim, to Bayer Aktiengesellschaft. Textile substrate having coatings of polycarbonate-polyurea elastomer. 3,900,688, Cl. 428-246.000.

Thomas, Mary R.: *See—*
Lalk, Robert H.; Schmidt, Donald L.; and Thomas, Mary R., 3,900,619.

Thomas, Virgil E., Jr.; and Quist, Donald G., to United States of America, Navy. Arbs TV tracker. 3,900,704, Cl. 178-6.800.

Thomis, Wendl: *See—*
Doyle, Robert O.; Kirsch, Jordan; and Thomis, Wendl, 3,900,251.

Thomson Industries, Inc.: *See*—
Thomson, John B., 3,900,233.

Thomson, John B., to Thomson Industries, Inc. Linear motion ball bearing assembly and ball conforming shaft. 3,900,233, Cl. 308-6.00C.

Thorn Lighting Limited: *See*—
Mason, David Robert; Cole, Susan Margaret; Cayless, Maurice Arthur; and Wharmby, David Osborn, 3,900,754.

Tichenor, Clyde L., to Berkey-Colortran, Inc. Compact follow spot. 3,900,726, Cl. 240-41.35R.

Tickle, John Edward, to Ferranti Limited. Training simulators for submarine periscopes. 3,900,703, Cl. 178-6.000.

Tillett, Peter Irving: *See*—
Kynaston, David; Tillett, Peter Irving; and Paden, Richard Stephen, 3,900,734.

Tiner, Robert L.: *See*—
Chatterji, Jiten; Holtmyer, Marlin D.; and Tiner, Robert L., 3,900,070.

Tisdale, Lawrence H.; and Lesensky, Leonard, to Raytheon Company. Arc suppressing coating for metal-dielectric interface surfaces. 3,900,755, Cl. 313-212.000.

Titus, Donald E.; and Tsao, Sherman H. M., to International Business Machines Corporation. Method and apparatus for generation of multiple uniform fluid filaments. 3,900,162, Cl. 239-102.000.

Tjutjunnikov, Anatoly Borisovich; Tjutjunnikov, Boris Nikanorovich; Marchenko, Alexandr Nikolaevich; Burin, Viktor Leontievich; Bolotin, Josif Mironovich; Drozdov, Anatoly Sergeevich; Koval, Leonid Petrovich; Didenko, Zoya Vasilievna; Ljubushkin, Georgy Vasilievich; Budnik, Jury Mikhailovich; Moskvin, Vladimir Dmitrievich; and Bolyanovsky, Dmitry Mikhailovich. Column for heat-and-mass exchange between gas and liquid. 3,900,537, Cl. 261-122.000.

Tjutjunnikov, Boris Nikanorovich: *See*—
Tjutjunnikov, Anatoly Borisovich; Tjutjunnikov, Boris Nikanorovich; Marchenko, Alexandr Nikolaevich; Burin, Viktor Leontievich; Bolotin, Josif Mironovich; Drozdov, Anatoly Sergeevich; Koval, Leonid Petrovich; Didenko, Zoya Vasilievna; Ljubushkin, Georgy Vasilievich; Budnik, Jury Mikhailovich; Moskvin, Vladimir Dmitrievich; and Bolyanovsky, Dmitry Mikhailovich, 3,900,537.

Tobin, John H.: *See*—
Gay, Walter A.; and Tobin, John H., 3,900,519.

Tognola, Sergio: *See*—
Christ, Alfred; Tognola, Sergio; and Lehmann, Rolf, 3,899,999.

Toivanen, Toivo Adrian: *See*—
Kaasila, Kauko Johannes; Toivanen, Toivo Adrian; Harkki, Seppo Untamo; Neimela, Toivo Isak; Makipirtti, Simo A.; Malmstrom, Rolf E.; Tuominen, Tapio Kalevi; Aaltonen, Olavi August; and Noponen, Veikko H., 3,900,310.

Tokai Metals Co., Ltd.: *See*—
Nakayama, Ryozo; and Itakura, Sigeru, 3,900,657.

Tokuda, Yasunori: *See*—
Komatani, Taro; Yamada, Kazuo; Oguri, Eizo; and Tokuda, Yasunori, 3,900,462.

Tokyo Tanabe Company, Ltd.: *See*—
Suzuki, Tadayuki; Wada, Jin; Miyamatsu, Hiroki; Ueno, Shinji; and Shimizu, Mitsuhiro, 3,900,486.

Tomita, Shigeru: *See*—
Terajima, Kazuki; Tomita, Shigeru; Matsuda, Yoshindo; and Abe, Keiji, 3,900,422.

Tomomoto, Kenichi: *See*—
Irie, Sadanao; Tomomoto, Kenichi; Akahori, Toyohiko; and Simomura, Kazuhisa, 3,900,369.

Tonoike, Takao: *See*—
Sato, Akihiro; Takeda, Saburo; Konotsune, Shiro; Kato, Mitsuru; and Tonoike, Takao, 3,900,454.

Toray Industries, Inc.: *See*—
Kawakami, Ken-Ichi; Hatada, Kenji; and Yamaguchi, Yasuhiko, 3,900,538.

Torrington Company, The: *See*—
Alling, Richard L.; and Iffland, Roger L., 3,900,235.

Toth Aluminum Corporation: *See*—
Terry, John Christopher; Lippman, Alfred; Sebenik, Roger Frank; and Harris, Harry Gordon, Jr., 3,900,312.

Toyoda Koki Kabushiki Kaisha: *See*—
Sumi, Hirotaka; Suzuki, Isao; Yokoe, Isamu; and Matsuzaki, Tetsuo, 3,900,777.

Transitek Corporation: *See*—
Wingate, Sidney, 3,900,261.

Tremper, Donald R., to Signode Corporation. Articulated strap chute and guide means therefor. 3,899,963, Cl. 100-25.000.

Treptow, Ernest G.: *See*—
Johnson, Otto E.; Frase, Roland J.; and Treptow, Ernest G., 3,900,201.

Tress, Jack E.; and Hunter, Willard I., to United States of America, Interior. Charging an electric furnace. 3,900,696, Cl. 13-33.000.

Trimbitas, Dorin: *See*—
Constantinescu, Petre; Oachis, Emil; Trimbitas, Dorin; and Alexandrescu, Doina, 3,900,301.

Triumph Werke Nurnberg A.G.: *See*—
Hengelhaupt, Hans-Georg, 3,900,099.

Troth, Dennis L.: *See*—
Arvin, John R.; Sullivan, Robert E.; Troth, Dennis L.; and Verdouw, Albert J., 3,899,881.

Trouiller, Jean Claude; and Lafont, Guy, to Schlumberger Technology Corporation. Methods of preventing cycle skipping in processing acoustic well-logging signals. 3,900,824, Cl. 340-15.5AC.

Trumbull, Walter A.: *See*—
Schlosser, James A.; and Trumbull, Walter A., 3,899,913.

TRW Inc.: *See*—
Andrews, Sydney Alan, 3,900,130.
Ehrlich, Don E., 3,900,131.
Kuehn, Donald E.; and Lyon, John Keith, 3,900,132.
McIver, George W.; and Buie, James L., 3,900,724.

Tsao, Carson K. H., to Raytheon Company. Mine rescue system. 3,900,878, Cl. 343-112.00R.

Tsao, Sherman H. M.: *See*—
Titus, Donald E.; and Tsao, Sherman H. M., 3,900,162.

Tsemakhovich, Boris Davydovich: *See*—
Apalikov, Jury Ignatievich; Konon, Jury Alexeevich; Pervukhin, Leonid Borisovich; and Tsemakhovich, Boris Davydovich, 3,900,147.

Tsuiki, Takao; and Hatsukano, Yoshikazu, to Hitachi, Ltd. Key input circuit. 3,900,845, Cl. 340-365.00E.

Tsujimoto, Kayoshi, to Minolta Camera Kabushiki Kaisha. Flash synchronizing camera with mechanically and electrically timed shutter. 3,900,857, Cl. 354-50.000.

Tsukada, Kazuo; Sunagawa, Mitsuru; and Kanzaki, Yoshiharu, to Fujitsu Ltd. Automatic omega signal pattern synchronizing system. 3,900,876, Cl. 343-105.00R.

Tsunashima, Teruyoshi; Kaneko, Teruo; and Ichimura, Takeo, to Nippon Kogaku K.K. Soft-focus optical element. 3,900,249, Cl. 350-188.000.

Tsuzuki, Yukikazu: *See*—
Komatsu, Noboru; Kamigaito, Osami; Suzuki, Takatoshi; Doi, Haruo; Sano, Kazuya; Yamamoto, Nobuyuki; Kandori, Toshio; and Tsuzuki, Yukikazu, 3,900,429.

Tuominen, Tapio Kalevi: *See*—
Kaasila, Kauko Johannes; Toivanen, Toivo Adrian; Harkki, Seppo Untamo; Neimela, Toivo Isak; Makipirtti, Simo A.; Malmstrom, Rolf E.; Tuominen, Tapio Kalevi; Aaltonen, Olavi August; and Noponen, Veikko H., 3,900,310.

Tuovinen, Frans Heikki; Blomquist, Seppo Ilmari; Heikkila, Risto Markus; Honkasalo, Jorma Bruno; and Kunttu, Kalevi Johan, to Outokumpu Oy. Feeding ring for feeding ore into furnaces. 3,900,117, Cl. 214-18.00R.

Tupolev, Alexei Andreevich: *See*—
Tupolev, Andrei Nikolaevich; Tupolev, Alexei Andreevich; Minkner, Kurt Vladimirovich; Bonin, Alexandr Romanovich; Cheremukhin, Georgy Alexeevich; Bliznjuk, Valentin Ivanovich; Pukhov, Alexandr Leonidovich; Svischev, Georgy Petrovich; Bjushgens, Georgy Sergeevich; Nikolaev, Alexandr Vasilievich; and Mikeladze, Vitaly Georgievich, 3,900,178.

Tupolev, Andrei Nikolaevich; Tupolev, Alexei Andreevich; Minkner, Kurt Vladimirovich; Bonin, Alexandr Romanovich; Cheremukhin, Georgy Alexeevich; Bliznjuk, Valentin Ivanovich; Pukhov, Alexandr Leonidovich; Svischev, Georgy Petrovich; Bjushgens, Georgy Sergeevich; Nikolaev, Alexandr Vasilievich; and Mikeladze, Vitaly Georgievich. Supersonic aircraft with a delta wing. 3,900,178, Cl. 244-55.000.

Turba, Vittorio: *See*—
Valvassori, Alberto; Sartori, Guido; and Turba, Vittorio, 3,900,452.

Turlabor AG: *See*—
Lanker, Willi, 3,900,776.

Turner, Charlie B., to General Electric Company. Lighting control device. 3,900,763; Cl. 315-156.000.

Turner, John O., to Sun Research and Development Co. Preparation of 1,1'-peroxydicyclohexylamine. 3,900,489, Cl. 260-307.00F.

Turner, Peter H., to Sargent Industries, Inc. Bearing liner. 3,900,408, Cl. 252-12.600.

Turos, Sandor, to Semper AB. Process for preparing so called crumb for the manufacture of milk chocolate. 3,900,578, Cl. 426-580.000.

Tutino, Matthew: *See*—
Gibbon, John; Heacock, Burt; Lipnick, Richard; Strenkowski, John; and Tutino, Matthew, 3,900,846.

Tweeddale, Andrew D.: *See*—
Wright, Willard E.; and Tweeddale, Andrew D., 3,899,987.

Uchida, Isamu; Watanabe, Kenkichi; and Sentoku, Hideshi, to Laurel Bank Machine Co., Ltd. Coin wrapping apparatus. 3,899,864, Cl. 53-212.000.

Uchikoshi, Goji; and Nakamichi, Niro, to Nakamichi Research Inc. Process for detecting and adjusting a vertical orientation of magnetic heads and apparatus therefor. 3,900,888, Cl. 360-76.000.

Uda, Hiroshi: *See*—
Kawabata, Hidetsugu; Yamashita, Toshio; Uda, Hiroshi; Yoshida, Manabu; and Kitamura, Saburo, 3,900,716.

Ueno, Shinji: *See*—
Suzuki, Tadayuki; Wada, Jin; Miyamatsu, Hiroki; Ueno, Shinji; and Shimizu, Mitsuhiro, 3,900,486.

Ulcickas, Paul W.: *See*—
Freese, Robert W.; Lekebusch, Ronald C.; and Ulcickas, Paul W., 3,900,761.

Ulman, Lynn J.; and Green, Raymond G., to Westinghouse Electric Corporation. Digital pulse train tracker. 3,900,850, Cl. 343-7.300.

Underwood, William George Elphinstone; and Long, Alan Gibson, to Glaxo Laboratories Limited. Certain diazathiabicycloheptane derivatives. 3,900,487, Cl. 260-306.70C.

Union Carbide Corporation: *See*—
Bowen, James Harold; and Sollman, Kenneth John, 3,900,043.
Bradley, Howard B., 3,900,660.
Funderburk, James O., Jr.; and Vicik, Stephen J., 3,900,635.
Greaser, Sheridan H.; and Russell, Edwin T., 3,900,340.

Jackson, George Edward, 3,899,900.
Yen, Steven N.; and Osterholtz, Frederick D., 3,900,378.
Union Corporation: *See—*
Sim, James S. Y.; Van Horn, Maurice H.; Cohen, Arthur I.; Gordesky, Stanley E.; and Gordon, Stanley I., 3,900,559.
Union Oil Company of California: *See—*
Sarem, Amir M., 3,900,069.
Uniroyal, Inc.: *See—*
Neville, James J.; Ferrell, Wesley; and Shichman, Daniel, 3,900,062.
United Aircraft Corporation: *See—*
Brennan, John J., 3,900,626.
Davis, Jack W.; and Walch, Allan P., 3,900,804.
Delgrosso, Eugene J.; and Carlson, Carl E., 3,900,150.
United Artists Music and Records Group, Inc.: *See—*
Hunyar, Csaba K., 3,899,832.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Williamson, Douglas H., 3,899,876.
United Merchants and Manufacturers, Inc.: *See—*
Sackoff, Martin M.; and Pulaski, Gregory F., 3,900,644.
United States Envelope Company: *See—*
Gendron, Wilfred H., 3,900,159.
United States of America
Agriculture: *See—*
St. Mard, Hubert H.; Cooper, Albert S., Jr.; and Hamalainen, Carl, 3,900,666.
Air Force: *See—*
Geisler, Robert L.; Koury, James L.; and Johnston, Arch D., 3,899,919.
Hausfeld, Brian A., 3,899,925.
Hoft, Donald J.; and Shutt, Philip R., 3,900,799.
Lammers, Uve H. W., 3,900,744.
Milling, Robert W., 3,900,802.
Scott, William G.; Zickgraf, John H.; and Petron, Dennis A., 3,900,849.
Army: *See—*
Anderl, Josef H.; and Colaguori, Albert C., 3,900,772.
Lee, S. Yen, 3,900,596.
Natarelli, Gerard E., Jr.; Pinto, Frank G.; and Miller, Jacob I., 3,900,535.
Energy Research and Development Administration: *See—*
Katz, Joseph J.; and Janson, Thomas R., 3,900,034.
General Counsel-Code GP: *See—*
Richter, Ian A., 3,900,705.
Steele, Ernest R., 3,900,847.
Health, Education and Welfare: *See—*
Wilson, Billie J.; and Malley, Arthur, 3,900,461.
Interior: *See—*
Hunter, Willard L.; White, Jack C.; and Stickney, William A., 3,900,552.
Tress, Jack E.; and Hunter, Willard I., 3,900,696.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Daly, William M.; and McKenna, John F., Jr. Fault tolerant clock apparatus utilizing a controlled minority of clock elements. 3,900,741, Cl. 307-204.000.
Navy: *See—*
Chatten, Clarence K.; Eller, Saul A.; Folk, Reece; and Brisbane, Arthur P., 3,899,991.
Foin, Owen F., Jr.; and Miley, Frank P., 3,900,870.
Hampel, Daniel; Prost, Kalman J.; and Scheinberg, Norman R., 3,900,742.
Jensen, Garold K., 3,900,869.
Jensen, Garold K.; and McGeogh, James E., 3,900,871.
Jensen, Garold K.; and McGeogh, James E., 3,900,872.
Marriott, Carroll L.; Patzer, Hans E.; Hall, Ronald D.; Caposell, Charles D.; and Klein, Aaron David, 3,900,353.
Oliver, Haven D.; Burke, Richard K.; Dobson, Herbert, Jr.; and Grant, Leon E., 3,900,401.
Scheets, David F., 3,900,875.
Speiser, Jeffrey M.; and Whitehouse, Harper John, 3,900,721.
Thomas, Virgil E., Jr.; and Quist, Donald G., 3,900,704.
Transportation: *See—*
Long, Lennart Ernst, 3,900,829.
U.S. Philips Corporation: *See—*
Appels, Johannes Arnoldus; and Verkuijlen, Wilhelmus Henricus Cornelis Gerardus, 3,900,350.
Bertrams, Johannes Kurt, deceased; and Mulkens, Casper Antonius Henricus, administrator, 3,900,240.
Ketzer, Manfred, 3,900,173.
Weston, George Frederick, 3,900,752.
United States Steel Corporation: *See—*
Chao, Hung-Chi; Gross, John H.; Judd, Robert R.; and Rueckl, Roger L., 3,900,309.
DeLeon, Walter L., 3,899,831.
Giunta, Joseph S.; and Lazzaretti, Louis G., 3,900,065.
Universal Oil Products Company: *See—*
Adams, Frank H.; and Anderson, Robert F., 3,900,390.
Hayes, John C., 3,900,386.
Hilfman, Lee, 3,900,388.
Lehman, Bruce, 3,900,300.
Massie, Stephen N., 3,900,479.
Wilhelm, Frederick C., 3,900,387.
University of California, The Regents of the: *See—*
Brink, David L., 3,900,334.
Mackenzie, John D., 3,900,303.
Unruh, Dale H.; and Proksch, Frederick D., to Caterpillar Tractor Company. Fluidic accelerometer. 3,900,042, Cl. 137-38.000.
Up-Right, Inc.: *See—*
Johnson, Wallace J. S., 3,900,571.
Upjohn Company, The: *See—*
Hamilton, Ramon D.; and Schneider, William P., 3,900,513.
Renis, Harold E.; and Skaletzky, Louis L., 3,900,476.
Uraya, Tohru; and Kudo, Eichi, to Kanebo, Ltd. Male piece of the velvet type fastener. 3,900,652, Cl. 428-92.000.
Usami, Takashi: *See—*
Goto, Hideyuki; Morishita, Shoji; and Usami, Takashi, 3,900,160.
Uscher, Joseph: *See—*
Woodman, Gerald A.; Uscher, Joseph; and Jacoby, Henry C., 3,900,641.
USM Corporation: *See—*
Davies, John; and Skinner, Dennis E., 3,899,998.
Valvassori, Alberto; Sartori, Guido; and Turba, Vittorio, to Montecatini Edison S.p.A. Olefinic copolymers and process for the preparation thereof. 3,900,452, Cl. 260-80.780.
van der Hulst, Robert: *See—*
Muys, Gerard Tuynenburg; Lelieveld, Hubertus Leonardus Maria; and van der Hulst, Robert, 3,899,862.
Vanderveen, John W.: *See—*
Hunt, Harold R.; and Vanderveen, John W., 3,900,547.
Vanek, James C.: *See—*
Ammons, Vernon G.; and Vanek, James C., 3,900,686.
van Gulick, Norman Martin, to du Pont de Nemours, E. I., and Company. Thermally activated promoters for salt complex curing agents. 3,900,447, Cl. 260-77.5AM.
Van Horn, Maurice H.: *See—*
Sim, James S. Y.; Van Horn, Maurice H.; Cohen, Arthur I.; Gordesky, Stanley E.; and Gordon, Stanley I., 3,900,559.
Varberg, Thomas: *See—*
Bergh, Gunnar; Brass, Kjell; Hessner, Jorgen; and Varberg, Thomas, 3,900,343.
Vaupotic, Marcia P.: *See—*
Dickinson, William B.; and Vaupotic, Marcia P., 3,900,480.
VCA Corporation: *See—*
Kruck, Ralph E., 3,900,121.
VEB Pentacon: *See—*
Apel, Wolfgang, 3,900,254.
Aust, Gert-Rudiger; Hainy, Siegfried; and Korf, Erich, 3,900,861.
Veba-Chemie AG: *See—*
Hoppe, Gerhard; Leppek, Heinrich; Rensmann, Leo; and Kehr, Helmut, 3,900,361.
Vecchiotti, Camillo M., to Amerace Corporation. Hollow, multilayered, cross-linked plastic structures and process for producing same. 3,900,640, Cl. 428-36.000.
Velsicol Chemical Corporation: *See—*
Krenzer, John, 3,900,485.
Richter, Sidney B.; and Krenzer, John, 3,900,497.
Verdouw, Albert J.: *See—*
Arvin, John R.; Sullivan, Robert E.; Troth, Dennis L.; and Verdouw, Albert J., 3,899,881.
Vereinigte Aluminium-Werke Aktiengesellschaft: *See—*
Schoer, Heinz; and Schultze, Werner, 3,900,151.
Vereinigte Baubeschlagfabriken Gretsch & Co. GmbH: *See—*
Sittmann, Brigitte, 3,900,205.
Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft: *See—*
Schwarz, Karl, 3,900,127.
Verkuijlen, Wilhelmus Henricus Cornelis Gerardus: *See—*
Appels, Johannes Arnoldus; and Verkuijlen, Wilhelmus Henricus Cornelis Gerardus, 3,900,350.
Vicik, Stephen J.: *See—*
Funderburk, James O., Jr.; and Vicik, Stephen J., 3,900,635.
Vida, Julius A.; and Hooker, Mary L., to Kendall Company, The. Certain phenobarbital salts. 3,900,475, Cl. 260-256.40C.
Vignozzi, Pietro; and Cerioli, Paolo, to Fabbrica Italiana Magneti Marelli S.p.A. Electronic system to control operator circuits as a function of speed of machine rotating member. 3,900,013, Cl. 123-102.000.
Vincent, Gary A., to Dow Corning Corporation. Electrical devices containing nitroarylsiloxane dielectric fluid. 3,900,416, Cl. 252-63.700.
Vincent, Peter Incledon: *See—*
Mathews, Carl Fraser; Nield, Eric; Rose, John Brewster; and Vincent, Peter Incledon, 3,900,531.
Vogler, Franziska, heir: *See—*
Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Franziska, heir; Vogler, Niklaus E., heir; and Vogler, Heinrich, heir, 3,900,464.
Vogler, Heinrich, heir: *See—*
Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Franziska, heir; Vogler, Niklaus E., heir; and Vogler, Heinrich, heir, 3,900,464.
Vogler, Karl, deceased: *See—*
Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Franziska, heir; Vogler, Niklaus E., heir; and Vogler, Heinrich, heir, 3,900,464.
Vogler, Niklaus E., heir: *See—*
Furlenmeier, Andre; Lanz, Paul; Quitt, Peter; Vogler, Karl, deceased; Vogler, Franziska, heir; Vogler, Niklaus E., heir; and Vogler, Heinrich, heir, 3,900,464.

Vogt, Udo Walter; and Waher, Sven G., to Sandvik Aktiebolag. Nickel-chromium-iron alloy. 3,900,315, Cl. 75-124.000.

Vogtmann, Theodor: *See—*
Beck, Wolfgang; Brunner, Friedrich C.; Frasch, Peter U.; Ivancic, Blanka; Schwerdt, Friedrich W.; and Vogtmann, Theodor, 3,900,337.

Volker, Herbert W. Dispensing apparatus. 3,900,163, Cl. 239-112.000.

von Bebenburg, Walter; and Offermanns, Heribert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. 6-Aza-3H-1,4-benzodiazepines. 3,900,466, Cl. 260-239.30B.

Voronov, Nikolai Stefanovich: *See—*
Somov, Boris Stepanovich; Mamin, Alexandr Ilich; Novikov, Andrei Porfirievich; Filippov, Vyacheslav Ivanovich; Khirdzhiev, Sergei Grigorievich; Gurevich, Vladimir Zakharovich; Voronov, Nikolai Stefanovich; and Agafonov, Ivan Fedorovich, 3,899,908.

Voss, Peter; Niederprum, Hans; and Beyl, Volker, to Bayer Aktiengesellschaft. Perfluoroalkylsulfonic acid aminophenyl esters. 3,900,508, Cl. 260-456.00A.

VSI Automation Assembly, Inc.: *See—*
Taruntaev, Vladimir, 3,899,909.

Vulcan Materials Company: *See—*
St. Cyr, Lewis A.; and Young, Loren H., 3,900,298.

W. C. Heraeus GmbH: *See—*
Mai, Gerhard; Siepmann, Reiner; and Kummer, Franz, 3,900,428.

W. M. Chace Company: *See—*
Steigelman, James Q., 3,900,295.

W. R. Grace & Co.: *See—*
Guthrie, James L.; and Rendulic, Francis J., 3,900,594.
Holdsworth, Robert S.; O'Neill, Gerald J.; Simons, Charles W.; and DiBiasio, Vincent L., 3,900,568.
Hurst, John, 3,900,102.
Markofsky, Sheldon B., 3,900,423.

Waco Scaffold & Shoring Co.: *See—*
Mocny, Richard C.; and Mueller, Francis B., 3,900,179.

Wada, Jin: *See—*
Suzuki, Tadayuki; Wada, Jin; Miyamatsu, Hiroki; Ueno, Shinji; and Shimizu, Mitsuhiro, 3,900,486.

Wagner, Gerhard, to Siemens Aktiengesellschaft. Interrogator-responsor system for different interrogator codes. 3,900,867, Cl. 343-6.5LC.

Wagner, William H. Device for holding and protecting intravenous injection needles. 3,900,026, Cl. 128-133.000.

Waher, Sven G.: *See—*
Vogt, Udo Walter; and Waher, Sven G., 3,900,315.

Wahl, Josef; and Schmidt, Peter-Jurgen, to Robert Bosch G.m.b.H. Fuel-air mixture proportioning control system for internal combustion engines. 3,900,012, Cl. 123-32.0EA.

Wakabayashi, Manabu: *See—*
Takami, Norihiko; Hattori, Osamu; and Wakabayashi, Manabu, 3,899,827.

Wakabayashi, Nobuyoshi: *See—*
Ohara, Osamu; and Wakabayashi, Nobuyoshi, 3,900,440.

Walch, Allan P.: *See—*
Davis, Jack W.; and Walch, Allan P., 3,900,804.

Wald, Leon D., to Honeywell Inc. Analog and digital data interconversion system. 3,900,844, Cl. 340-347.00C.

Waldeck, Franz: *See—*
Konz, Wilhelm; Waldeck, Franz; and Jennewein, Hans-Michael, 3,900,566.

Wallace, Maynard. Die attachment for forming split type fasteners on molded parts. 3,900,183, Cl. 249-68.000.

Walter, Joachim: *See—*
Dierkes, Hubert; Schonol, Karl; Walter, Joachim; and Muller, Friedhelm, 3,900,608.

Walters, Robert Bruce, to General Electric Company. Insulated electrical conductor. 3,900,681, Cl. 428-379.000.

Walters, Russell W., to BMR Security Products Corporation. Locking bar assembly. 3,899,905, Cl. 70-91.000.

Walworth, Vivian K.: *See—*
McCann, Mary Conlin; Plummer, William T.; and Walworth, Vivian K., 3,900,858.

Wandel, Martin: *See—*
Hoppe, Peter; Drouven, Gustav; Wandel, Martin; Gutschik, Ernst; and Brokmeier, Dieter, 3,900,651.

Ward, Frederick Alfonso; and Harvey, Leslie Augustus. Jumping stand with pivotally mounted horizontal bar. 3,900,194, Cl. 272-1.00B.

Wardle, Peter Charles Darlington: *See—*
Page, Frederick Walter; and Wardle, Peter Charles Darlington, 3,900,092.

Warfield, Albert H.: *See—*
Kallianos, Andrew G.; Warfield, Albert H.; and Simpson, Melvyn I., 3,900,521.

Warwick, Leonard A., to Kraftco Corporation. Treatment of cheese slices to prevent sticking together. 3,900,574, Cl. 426-274.000.

Wasser, Willi: *See—*
Herzhoff, Peter; Gref, Hans; Maus, Fritz; Platz, Stephan; Friedsam, Josef; Schweicher, Wolfgang; Behr, Rolf; Wasser, Willi; and Browatzki, Kurt, 3,900,326.

Watanabe, Kenkichi: *See—*
Uchida, Isamu; Watanabe, Kenkichi; and Sentoku, Hideshi, 3,899,864.

Wayne H. Coloney Company, Inc.: *See—*
Benedict, Charles E.; and Oliver, Calvin C., 3,900,052.

Weaver, Harvey N.: *See—*
Bednar, John P.; and Weaver, Harvey N., 3,900,093.

Weber, Robert C. Mono-ski. 3,900,204, Cl. 280-11.13S.

Wegmann, Jacques; and Peter, Richard, to Ciba-Geigy AG. Dyestuff preparations and processes for the dyeing of synthetic organic material. 3,900,286, Cl. 8-172.000.

Wehr Corporation: *See—*
Lambert, Robert R., 3,899,823.

Weick, Walter Werner: *See—*
Dapkus, Paul Daniel; Dixon, Richard Wayne; and Weick, Walter Werner, 3,900,864.

Weigele, Manfred: *See—*
Leimgruber, Willy; and Weigele, Manfred, 3,900,511.

Weil, Edward D., to Stauffer Chemical Company. Flame retarding of solid substrates with hydroxyalkylphosphonate carbamates. 3,900,665, Cl. 428-276.000.

Weimer, Paul Kessler, to RCA Corporation. Charge amplifier. 3,900,743, Cl. 307-221.00D.

Weiss, Edward L.: *See—*
Bell, Barry A.; and Weiss, Edward L., 3,900,866.

Welch, Dennis W.; and Lipsky, Milton H. Therapeutic elastic bandage. 3,900,035, Cl. 128-402.000.

Wendt, Gerhard, to MITEC Moderne Industrietechnik GmbH. Method and apparatus for measuring the distance and/or relative elevation between two points in an opto-electronic manner. 3,900,260, Cl. 356-5.000.

Weresch, Thomas. Device for cutting bending and corrugating the leads of electric components. 3,900,053, Cl. 140-105.000.

Werges, Darrell L., to Nalco Chemical Company. Process for making acrylamide. 3,900,516, Cl. 260-561.00N.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See—*
Konersmann, Erhard; and Gruber, Rudolf, 3,900,720.

Werner, Paul: *See—*
Wirtz, Egon; and Werner, Paul, 3,900,225.

Werner & Pfleiderer: *See—*
Seufert, Wilhelm, 3,900,188.

Wertman, Charles D., to Raymond Lee Organization, Inc., The, a part interest. Tent structure. 3,899,853, Cl. 52-2.000.

Westates Space-Era Products, Inc.: *See—*
Stephens, James B., 3,900,135.

Western Electric Company, Incorporated: *See—*
Lando, David Jacob, 3,900,614.

Western Progress, Inc.: *See—*
Doyle, Robert L.; and Swezy, Montgomery C., 3,899,843.

Westinghouse Electric Corporation: *See—*
Harrison, Earnest R., Jr., 3,899,834.
Kim, He B., 3,900,863.
Parker, Stephen R., 3,899,882.
Ulman, Lynn J.; and Green, Raymond G., 3,900,850.

Weston, George Frederick, to U.S. Philips Corporation. Glow discharge display device with intersecting electrode systems sealed between opposing plates. 3,900,752, Cl. 313-188.000.

Westover, Dwight G.; and Grant, Frederic F., to Bell & Howell Company. Card advancing and function performing methods and apparatus. 3,900,191, Cl. 271-3.000.

Westvaco Corporation: *See—*
Goodsite, James R., 3,900,101.

Wetmore, Judson D.: *See—*
Sovish, Richard C.; Sullivan, Michael B.; and Wetmore, Judson D., 3,899,807.

Weyl, Reinhard: *See—*
Zerbst, Helmut; Weyl, Reinhard; and Dietrich, Isolde, 3,900,808.

Wharmby, David Osborn: *See—*
Mason, David Robert; Cole, Susan Margaret; Cayless, Maurice Arthur; and Wharmby, David Osborn, 3,900,754.

Wheaton Industries: *See—*
Balas, John Thomas, 3,900,186.

Whirlpool Corporation: *See—*
Buchser, William J., 3,900,220.

White, Allen A.; Garrison, Harold Keith; and Brooks, Dean P., to Hesston Corporation, Inc. Machine for loading, stacking and unloading crops. 3,899,966, Cl. 100-255.000.

White, Jack C.: *See—*
Hunter, Willard L.; White, Jack C.; and Stickney, William A., 3,900,552.

White, Robert Gordon, to Tektronix Inc. Stylus actuator. 3,900,853, Cl. 346-139.00R.

White, Sidney S.: *See—*
Dalter, Raymond S.; and White, Sidney S., 3,900,409.

White-Westinghouse Corporation: *See—*
Wright, Dexter V.; and Hague, John M., III, 3,899,933.

Whitehead, Donald Shaffer: *See—*
Casey, Richard C.; Duggan, Robert J.; Grosky, Stephen A.; Jen, Dixson Teh-Chao; Serra, John J.; Whitehead, Donald Shaffer; and Boyce, Thomas E., 3,900,834.

Whitehouse, Harper J.: *See—*
Lamel, Arthur E.; Squire, William D.; and Whitehouse, Harper J., 3,900,827.

Whitehouse, Harper John: *See—*
Speiser, Jeffrey M.; and Whitehouse, Harper John, 3,900,721.

Whitfield, Joseph A., to Caterpillar Tractor Company. Dual filter arrangement. 3,900,400, Cl. 210-238.000.

Widran, Jerrold. Endoscope with uninterrupted flow purging system. 3,900,022, Cl. 128-7.000.

Wiedmann, Siegfried Kurt, to International Business Machines Corporation. Hybrid storage circuit. 3,900,838, Cl. 340-173.00R.

Wiesler, Mordechai; and McCarron, John C., to Teledyne, Inc. Visual selection and precision isolation system for microelectronic units. 3,900,244, Cl. 350-81.000.

Wiggins Teape Research & Development Limited: *See*—
Evans, Brian Edward, 3,900,671.

Wilbur, Benjamin C.: *See*—
Wolgemuth, Larry G.; and Wilbur, Benjamin C., 3,900,655.

Wilby, Brian Hanson: *See*—
Copsey, Mervyn John; and Wilby, Brian Hanson, 3,900,376.

Wild, Hermann; and Rau, Arthur, to J. G. Anschutz GmbH. Recoilless weapon. 3,899,845, Cl. 42-69.00A.

Wiley, Donald F., to Cosden Oil & Chemical Company. Coextrusion of polystyrene and polysulfones. 3,900,548, Cl. 264-171.000.

Wilhelm, Frederick C., to Universal Oil Products Company. Hydrocarbon conversion with a multimetallic catalytic composite. 3,900,387, Cl. 208-139.000.

Wille, Baptist, to Balzers Patent - und Beteiligungs - Aktiengesellschaft. Method for manufacture of a refracting, light permeable oxide layer. 3,900,609, Cl. 427-166.000.

Williams, Charlton E.: *See*—
Larkin, Robert S.; Lund, Nean K.; and Williams, Charlton E., 3,900,874.

Williams, John F.: *See*—
Purdy, David L.; and Williams, John F., 3,900,152.

Williams, Roger B., Jr.; Loshbough, Richard C.; and Cherry, Richard A., to Reliance Electric Company. Conveyor scale calibration. 3,899,915, Cl. 73-1.00R.

Williamson, Douglas H., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Flame tube for a gas turbine combustion equipment. 3,899,876, Cl. 60-39.660.

Williamson, John: *See*—
Randle, Raymond Thomas; Williamson, John; and Wilson, David, 3,900,403.

Willoughby, Donald A.: *See*—
Boerger, David H.; Krugler, Allen D., Jr.; and Willoughby, Donald A., 3,899,897.

Wilson, Billie J.; and Malley, Arthur, to United States of America, Health, Education and Welfare. Lymphocyte stroma adsorbent. 3,900,461, Cl. 260-209.00D.

Wilson, David: *See*—
Randle, Raymond Thomas; Williamson, John; and Wilson, David, 3,900,403.

Wilson, Earl D., to Randtron. Rubber grommet array for sizing screens. 3,900,393, Cl. 209-399.000.

Wilson, James N.: *See*—
Barclay, Francis W.; Frey, J. Richard; Wilson, James N.; and Besant, Robert W., 3,900,365.

Wilson, John: *See*—
Corbett, Dennis Thomas; and Wilson, John, 3,900,611.

Wilson, Walter Alexander: *See*—
Austin, Lowell W.; and Wilson, Walter Alexander, 3,900,383.

Winfrey, Richard C. Rough terrain vehicle utilizing gyroscopic forces (inchworm). 3,900,076, Cl. 180-8.00E.

Wingate, Sidney, to Transitek Corporation. Electronic range finder. 3,900,261, Cl. 356-5.000.

Wingler, Frank; and Muller, Richard, to Bayer Aktiengesellschaft. Pulverulent acrylic resin binder mixtures containing triglycidyl isocyanurate and cellulose acetobutyrate. 3,900,435, Cl. 260-17.000.

Winkelmann, Erhardt; and Raether, Wolfgang, to Hoechst Aktiengesellschaft. 1-(Pyridyl-thioalkyl)-2-alkyl-5-nitro-imidazoles. 3,900,482, Cl. 260-294.80G.

Winkelmann, Jurgen: *See*—
Luther, Hans Werner; Romer, Rudolf; Winkelmann, Jurgen; and Rossmann, Winfried, 3,899,978.

Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., to Firmenich & Cie. Flavoring agent. 3,900,581, Cl. 426-535.000.

Winter, Max; Gautschi, Fritz; Flament, Ivon; Stoll, Max; and Goldman, Irving M., to Firmenich & Cie. Flavoring agent. 3,900,582, Cl. 426-535.000.

Wirtz, Egon; and Werner, Paul, to Keiper, Fritz. Fitting for a seat having a seat element and a tiltable backrest element. 3,900,225, Cl. 297-367.000.

Wisconsin Alumni Research Foundation: *See*—
Sih, Charles J., 3,900,512.

Witiak, John D. Remote-control device for spinning tops. 3,899,849, Cl. 46-241.000.

Witt, Donald R., to Phillips Petroleum Company. Olefin polymerization catalyst. 3,900,457, Cl. 260-94.90D.

Wittwer, Robert O.; and Harbison, William H., to Anderson Company, The. Windshield wiper blade. 3,899,800, Cl. 15-250.420.

Woerner, Hans, to Mineral Research & Development Corporation. Cuprammonium acetate complex and method of preparing. 3,900,504, Cl. 260-438.100.

Wolf, Gerhard Dieter; and Bentz, Francis, to Bayer Aktiengesellschaft. Copolyamides which contain quinazolinedione structures. 3,900,448, Cl. 260-78.00R.

Wolf, Karlheinz: *See*—
Hildebrand, Dietrich; Kruckenberg, Winfried; Kuhnel, Werner; Molls, Hans Heinz; and Wolf, Karlheinz, 3,900,283.

Wolfelsperger, Robert O., to Young, William E. Internally contained tear-inducing tab for vacuum sealed packages. 3,900,105, Cl. 206-498.000.

Wolgemuth, Larry G.; and Wilbur, Benjamin C., to Atlantic Richfield Company. Laminated safety glass and/or plastic. 3,900,655, Cl. 428-214.000.

Wood II, Obert Reeves: *See*—
Silfvast, William Thomas; and Wood II, Obert Reeves, 3,900,803.

Woodard, Ollie C.: *See*—
Michail, Michel S.; Woodard, Ollie C.; and Yourke, Hannon S., 3,900,736.

Woodell, Rudolph, to du Pont de Nemours, E. I., and Company. Flexible nonwoven sheets for use against splashing liquids. 3,900,631, Cl. 428-195.000.

Woodman, Gerald A.; Uscher, Joseph; and Jacoby, Henry C., to Lancaster Products Company. Method of forming decorator panels. 3,900,641, Cl. 428-38.000.

Woodward, Robert Burns, to Ciba-Geigy Corporation. Esters of hydroxymethyl-dioxabicyclononene. 3,900,500, Cl. 260-340.700.

Woolley, Harold Oakley, Jr.; and Ryle, Bernard Groene, to AMP Incorporated. Registration device for printed circuits. 3,900,257, Cl. 355-29.000.

Wright, Alan R.: *See*—
Goulish, Gabriel J.; Terlecki, Leo; and Wright, Alan R., 3,900,236.

Wright, Dexter V.; and Hague, John M., III, to White-Westinghouse Corporation. Transmission with antibacklash means. 3,899,933, Cl. 74-440.000.

Wright, Robert J., to Research Laboratories of Australia Pty. Limited. Electrostatic duplicating process. 3,900,586, Cl. 427-19.000.

Wright, Willard E.; and Tweeddale, Andrew D., to Boeing Company, The. Fail-safe control system for hydrofoil craft. 3,899,987, Cl. 114-66.50H.

Wu, Chin Tao, to RCA Corporation. Apparatus for scanning raised indicia. 3,900,717, Cl. 235-61.11C.

Wyant, Reece E., to Dresser Industries, Inc. Method and apparatus for aligning a drill bit over a predetermined point. 3,899,833, Cl. 33-228.000.

Wyeth, John: *See*—
Azzi, Victor D.; and Wyeth, John, 3,900,112.

Wyhof, John R., to ICI United States Inc. Dielectric resins. 3,900,693, Cl. 428-511.000.

Wyler, Eugen; and Buser, Max, to Lovida AG. Case sealed by a cover, a process for the manufacture of a case covered by a foil and equipment for executing the process. 3,900,125, Cl. 215-341.000.

Wyler, Sigfried: *See*—
Rembold, Heinz; Haug, Theobald; Wyler, Sigfried; and Kiefer, Jurg, 3,900,449.

Xerox Corporation: *See*—
Bartlett, Fred J.; Bevis, Paul A.; Hoyt, Hazen L., III; and Mercer, Francis T., 3,900,405.
Dhoble, Prafulla S., 3,900,590.
Fisher, Donald J., 3,900,588.
Fraser, Lawrence J.; and Parker, Delmer G., 3,900,001.
Hoppner, Werner F.; and Shogren, David K., 3,900,258.
Lenhard, Myron James; and Mammino, Joseph, 3,900,587.
Lindblad, Nero R.; Johnson, Gordon E.; and Sharp, James H., 3,900,589.
Maltz, Martin Sidney, 3,900,800.
Punt, Vernon E., 3,900,817.
Stange, Klaus K., 3,900,002.

Yada, Akira; and Hori, Yuji, to Dai-Ichi Kogyo Seiyaku Co. Ltd. Process for preparing alkali carboxymethyl cellulose. 3,900,463, Cl. 260-231.0CM.

Yamada, Kazuo: *See*—
Komatani, Taro; Yamada, Kazuo; Oguri, Eizo; and Tokuda, Yasunori, 3,900,462.

Yamaguchi, Yasuhiko: *See*—
Kawakami, Ken-Ichi; Hatada, Kenji; and Yamaguchi, Yasuhiko, 3,900,538.

Yamamoto, Kazunobu, to Rank Xerox Ltd. Paddle-wheel development system. 3,900,255, Cl. 355-3.0DD.

Yamamoto, Nobuyuki: *See*—
Komatsu, Noboru; Kamigaito, Osami; Suzuki, Takatoshi; Doi, Haruo; Sano, Kazuya; Yamamoto, Nobuyuki; Kandori, Toshio; and Tsuzuki, Yukikazu, 3,900,429.

Yamanaka, Yoshimasa: *See*—
Tanji, Mikiharu; Yamanaka, Yoshimasa; and Takahashi, Isao, 3,900,764.

Yamane, Tadayuki; and Hirano, Yutaka, to Kuraray Co., Ltd. Method of spinning composite filaments. 3,900,549, Cl. 264-176.00F.

Yamashita, Terumasa: *See*—
Takashima, Kazushige; Nishigaki, Katumi; and Yamashita, Terumasa, 3,900,775.

Yamashita, Toshio: *See*—
Hasegawa, Nobuo; Yamashita, Toshio; and Kitamura, Saburo, 3,900,883.
Kawabata, Hidetsugu; Yamashita, Toshio; Uda, Hiroshi; Yoshida, Manabu; and Kitamura, Saburo, 3,900,716.

Yamauchi, Satoshi, to Ricoh Co., Ltd. Hybrid arithmetic device. 3,900,719, Cl. 235-150.520.

Yamazaki, Hiroshi; and Ando, Tetsuo, to Sony Corporation. Digital circuit for amplifying a signal. 3,900,747, Cl. 307-304.000.

Yates, Robert W.: *See*—
Di Salvo, Ronald M.; and Yates, Robert W., 3,900,252.

Yen, Steven N.; and Osterholtz, Frederick D., to Union Carbide Corporation. Hydrogels from radiation crosslinked blends of hydrophilic polymers and fillers. 3,900,378, Cl. 204-159.140.

Yokoe, Isamu: *See*—
Sumi, Hirotaka; Suzuki, Isao; Yokoe, Isamu; and Matsuzaki, Tetsuo, 3,900,777.
Yokokawa, Masanori: *See*—
Inoue, Shohei; Kanbe, Masaki; Takada, Tadamichi; Miyazaki, Nobuyuki; and Yokokawa, Masanori, 3,900,424.
Yokota, Hiroomi; and Masuda, Taizo, to Ichise, Yoshio. Steel cable anchor and method for withdrawing the same. 3,899,892, Cl. 61-39.000.
Yonai, Fumiaki: *See*—
Osakabe, Kuniharu; and Yonai, Fumiaki, 3,900,854.
Yoshida, Isao: *See*—
Katayama, Yoshifumi; Kotera, Nobuo; Murayama, Yoshimasa; and Yoshida, Isao, 3,900,881.
Yoshida Kogyo Kabushiki Kaisha: *See*—
Kawashima, Teruaki, 3,899,804.
Yoshida, Manabu: *See*—
Kawabata, Hidetsugu; Yamashita, Toshio; Uda, Hiroshi; Yoshida, Manabu; and Kitamura, Saburo, 3,900,716.
Yoshida, Yoshinobu: *See*—
Oishi, Yasushi; Hayashi, Jun; and Yoshida, Yoshinobu, 3,900,322.
Yotsugi, Masamitsu. Electric wire insulating cover. 3,900,697, Cl. 174-5.00R.
Yotsugi, Sanji. Electric wire insulating cover. 3,900,698, Cl. 174-5.00R.
Young, Loren H.: *See*—
St. Cyr, Lewis A.; and Young, Loren H., 3,900,298.
Young, William E.: *See*—
Wolfelsperger, Robert O., 3,900,105.
Yourke, Hannon S.: *See*—
Michail, Michel S.; Woodard, Ollie C.; and Yourke, Hannon S., 3,900,736.
Yuan, Edward L., to du Pont de Nemours, E. I., and Company. Bondable adhesive coated polyimide film and laminates. 3,900,662, Cl. 428-252.000.
Yuasa Battery Company Limited: *See*—
Shoichiro, Ito; Ohya, Tokuzi; and Nagai, Shozi, 3,900,341.
Zabotin, Alexandr Alexandrovich; Onikov, Eduard Arshakovich; Galperin, Alexandr Lvovich; Loschilin, Evgeny Dmitrievich; Lileev, Valerian Petrovich; German, Roman Anatolievich; Rutkevich, Zinovy Yakovlevich; and Sakharov, Boris Alexandrovich. Apparatus for guiding weft thread carriers in the shed of a loom of a progressive shedding type. 3,900,049, Cl. 139-12.000.
Zaky, Safwat George, to Northern Electric Company Limited. Optical modulator having compensation for thermal and space charge effects. 3,900,247, Cl. 350-150.000.
Zanker, Paul, to Saint-Gobain Industries. Window. 3,899,858, Cl. 52-172.000.
Zannucci, Joseph S.; and Lappin, Gerald R., to Eastman Kodak Company. Titanium dioxide pigmented polymer compositions with improved visible and ultraviolet light stability. 3,900,442, Cl. 260-42.460.
Zdanowski, Richard E.; and Larsson, Bjorn E., to Rohm and Haas Company. Copolymer-wax composition. 3,900,438, Cl. 260-28.50R.
Zellweger, Ltd.: *See*—
Haberkern, Klaus, 3,899,809.
Zenith Radio Corporation: *See*—
Adler, Robert, 3,900,748.
Baranski, Ronald S.; and Baur, Leslie L., 3,899,812.
Cook, Charles A.; and Hajduk, Thaddeus J., 3,899,994.
Kaplan, Sam H., 3,900,757.
Park, Yong S., 3,899,996.
Zerbst, Helmut; Weyl, Reinhard; and Dietrich, Isolde. Magnetic lens assemblies for corpuscular ray devices which operate under vacuum. 3,900,808, Cl. 335-210.000.
Zickgraf, John H.: *See*—
Scott, William G.; Zickgraf, John H.; and Petron, Dennis A., 3,900,849.
Zographos, Georgeos; and Mockli, Peter, to Ciba-Geigy AG. Use of sublimable disperse dyes in photoelectrophoretic image reproduction. 3,900,318, Cl. 96-1.300.
Zukriegel, Hans; and Schrom, Eike Karl, to Entzmann, Karl, a part interest. Method for protecting copper surfaces against corrosion. 3,900,348, Cl. 148-6.240.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF AUGUST, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Brebant, Robert, to Chemetron Corp. Apparatus for treating a liquid with a gas, notably for deodorizing edible oil. Re. 28,524, 8–19–75, Cl. 202—175.

Cement and Concrete Association Terminal House, The: *See*—
Maynard, David P., and Weaver. Re. 28,522.

Chemetron Corp.: *See*—
Brebant, Robert. Re. 28,524.

Godfrey, Murrel: *See*—
Greene, Janice L., and Godfrey. Re. 28,525.

Greene, Janice L., and M. Godfrey, to The Standard Oil Co. Process for hydrolyzing nitriles. Re. 28,525, 8–19–75, Cl. 260—557.

Hammes, Wilhelm, to Mauser Kommanditgesellschaft. Container construction. Re. 28,521, 8–19–75, Cl. 220—306.

Hill, Morse, and S. J. Matas, to Republic Steel Corp. High strength alloy steel compositions and process of producing high strength steel including hot-cold working. Re. 28,523, 8–19–75, Cl. 75—123.

Mahorney, Ardith: *See*—
Mahorney, Kenneth R. Re. 28,520.

Mahorney, Kenneth R., deceased, by Ardith Mahorney, legal representative, to Ross Operating Valve Co. Safety valve assembly for controlling clutch and brake in power press or the like. Re. 28,520, 8–19–75, Cl. 137—596.

Matas, Stephen J.: *See*—
Hill, Morse, and Matas. Re. 28,523.

Mauser Kommanditgesellschaft: *See*—
Hammes, Wilhelm. Re. 28,521.

Maynard, David P., and J. Weaver, to The Cement and Concrete Association Terminal House. Apparatus for a rigid road which has a textured surface. Re. 28,522, 8–19–75, Cl. 404—93.

Mishcon, Lester, to The Singer Co. Circular knitting machine with pattern wheels. Re. 28,519, 8–19–75, Cl. 66—50.

Republic Steel Corp.: *See*—
Hill, Morse, and Matas. Re. 28,523.

Ross Operating Valve Co.: *See*—
Mahorney, Kenneth R. Re. 28,520.

Singer Co., The: *See*—
Mishcon, Lester. Re. 28,519.

Standard Oil Co., The: *See*—
Greene, Janice L., and Godfrey. Re. 28,525.

Stein, William B., to The Warner & Swasey Co. Cutoff tool having improved cutting tip. Re. 28,518, 8–19–75, Cl. 29—95.

Warner & Swasey Co., The: *See*—
Stein, William B. Re. 28,518.

Weaver, John: *See*—
Maynard, David P., and Weaver. Re. 28,522.

LIST OF PLANT PATENTEES

Ecke, Paul, Ranch: *See*—
Ecke, Paul, Jr. 3,766.

Ecke, Paul, Jr., to Paul Ecke Ranch. Poinsettia plant. point reddy light). 3,766, 8–19–75, Cl. 86.

Irwin, Lawrence T., to J and L Plants, Inc. Kalanchoe plant. 3,765, 8–19–75, Cl. 68.

J and L Plants, Inc.: *See*—
Irwin, Lawrence T. 3,765.

Yonemoto, Takeshi Y. Carnation plant. 3,767, 8–19–75, Cl. 70.

Yonemoto, Takeshi Y. Carnation plant. 3,768, 8–19–75, Cl. 70.

LIST OF DESIGN PATENTEES

AB Stios: *See*—
Celander, Robert, Noll, Widlund, and Strandberg. 236,385.

AMP Inc.: *See*—
Mesbahuddin Ahmed, A. A. 236,349.

Advanced Management Engineering & Research Co.: *See*—
Long, Larry K., Knight, Jackson, and Winter. 236,299.

Allibert Exploitation: *See*—
Dranssart, Jean-Paul. 236,307.

American Brands, Inc.: *See*—
Eron, Theodore. 236,359.

Amerace Corp.: *See*—
Teague, Walter D., Jr. 236,328.
Teague, Walter D., Jr., 236,329.

American Hospital Supply Corp.: *See*—
Banks, Percival C. 236,293.

American LaFrance, Inc.: *See*—
Vorkapich, Theodore. 236,344.

Audette, Robert B., to Cafe-Bar International Pty., Ltd. Casing for a dispensing machine. 236,391, 8–19–75, Cl. D94—3.

Baca, Robert D. Soap holder. 236,298, 8–19–75, Cl. D6—90.

Baker, Olin H., to Meese, Inc. Quill box. 236,389, 8–19–75, Cl. D87—1.

Ball, Maurene J. Cigarette pack dispenser. 236,308, 8–19–75, Cl. D6—114.

Banks, Percival C., to American Hospital Supply Corp. Surgical gown. 236,293, 8–19–75, Cl. D2—17.

Bauer, Frederick K. 236,390, 8–19–75, Cl. D87—5.

Belinkoff, Irving R.: *See*—
Booty, Donald J., Belinkoff, and Balter. 236,316.

Bissell, Inc.: *See*—
Fleury, Noel W. 236,295.

Booty, Donald J., I. R. Belinkoff, and D. W. Balter, to LCA Corp. Oven. 236,316, 8–19–75, Cl. D7—126.

Brown, De Peyster D. Patty maker. 236,312, 8–19–75, Cl. D7—43.

Brudy, Peter E., to Dominion Auto Accessories Ltd. Tail light. 236,371, 8–19–75, Cl. D48—32.

Brunswick Corp.: *See*—
Miller, Arthur F. 236,338.

Buan, Danilo P.: *See*—
Groswith, Charles T., and Buan. 236,373.

Burroughs Corp.: *See*—
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Cafe-Bar International Pty., Ltd.: *See*—
Audette, Robert B. 236,391.

Celander, Robert, J. A. Noll, U. Widlund, and K. Strandberg, to AB Stios. Disposable sanitary pad. 236,385, 8–19–75, Cl. D83—1.

Clayton, Richard G., to Burroughs Corp. Molded panel. 236,340, 8–19–75, Cl. D13—1.

Clayton, Richard G., and J. J. Sims, to Burroughs Corp. Tape unit and console or a data system. 236,351, 8–19–75, Cl. D26—5.

Clayton, Richard G., to Burroughs Corp. Cabinet for a data system. 236,357, 8–19–75, Cl. D26—5.

Conner, James M.: *See*—
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Cooper Laboratories, Inc.: *See*—
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Cromoga, Walter V. Skinning knife. 236,321, 8–19–75, Cl. D8—20.

Crownover, Glen D., to Malm Fireplaces, Inc. Free standing fireplace. 236,347, 8–19–75, Cl. D23—97.

Dango, Geronimo A. Sheet material holder. 236,342, 8–19–75, Cl. D19—91.

Dart Industries Inc.: *See*—
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Deere & Co.: *See*—
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De Fluri, Neil: *See*—
Katzman, Marvin, and De Fluri. 236,386.
Katzman, Marvin, and De Fluri. 236,387.

Deibel, Raymond A., to Trico Products Corp. Vehicle windshield wiper blade assembly. 236,337, 8–19–75, Cl. D12—155.

Dominion Auto Accessories Ltd.: *See*—
Brudy, Peter E. 236,371.

Dranssart, Jean-Paul, to Allibert Exploitation. Wall mounted vanity cabinet. 236,307, 8–19–75, Cl. D6—104.

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144 3,900,048

CLASS 139
12 3,900,049
3,900,050
25 3,900,051
153 3,900,052

CLASS 140
105 3,900,053

CLASS 141
1 3,900,054
67 3,900,055
93 3,900,056

CLASS 145
50E 3,900,057
50R 3,900,058

CLASS 148
1.5 3,900,344
3,900,345
6.24 3,900,348
9.6 3,900,346
12B 3,900,347
32 3,900,349
175 3,900,350
186 3,900,351
187 3,900,352

CLASS 150
1 3,900,059
52R 3,900,060

CLASS 152
352 3,900,061
361FP 3,900,062

CLASS 156
3 3,900,353
73.2 3,900,354
74 3,900,355
145 3,900,356
185 3,900,357
215 3,900,358
242 3,900,359
272 3,900,360
334 3,900,361
577 3,900,362
612 3,900,363

CLASS 160
310 3,900,063

CLASS 162
274 3,900,364

CLASS 164
51 3,900,064
273R 3,900,065
282 3,900,066
332 3,900,067

CLASS 166
152 3,900,068
274 3,900,069
308 3,900,070

CLASS 172
15 3,900,071
238 3,900,072
430 3,900,073

CLASS 174
5R 3,900,697
3,900,698
15BH 3,900,699
16R 3,900,700
102R 3,900,701
126CP 3,900,702

CLASS 175
242 3,900,074

CLASS 176
22 3,900,365
37 3,900,366
87 3,900,367

CLASS 178
6 3,900,703
6.8 3,900,704
3,900,705
7.2 3,900,706

CLASS 179
156R 3,900,707
170.2 3,900,708

CLASS 180
6.3 3,900,075
8E 3,900,076
9.46 3,900,077
82R 3,900,078
121 3,900,079

CLASS 182
36 3,900,080
73 3,900,081

CLASS 188
69 3,900,082
72.2 3,900,083
196D 3,900,085
196F 3,900,084
202 3,900,086

CLASS 192
.094 3,900,090
3T 3,900,087
64 3,900,088
85AA 3,900,089
98 3,900,091

CLASS 194
9T 3,900,092
3,900,093

CLASS 195
103.5R 3,900,368
CLASS 197
1R 3,900,094
3,900,095
127R 3,900,098
159 3,900,099
CLASS 198
23 3,900,096
127R 3,900,097
CLASS 200
5R 3,900,709
81H 3,900,710
238 3,900,711
307 3,900,712
CLASS 202
175 Re.28,524
247 3,900,369
CLASS 204
38A 3,900,370
67 3,900,371
81 3,900,372
96 3,900,385
99 3,900,373
129.5 3,900,374
140 3,900,375
141.5 3,900,376
149 3,900,377
159.14 3,900,378
159.24 3,900,379
163R 3,900,380
181 3,900,381
195M 3,900,382
211 3,900,383
286 3,900,384
CLASS 206
45.13 3,900,100
320 3,900,101
411 3,900,102
431 3,900,103
491 3,900,104
498 3,900,105
519 3,900,106
CLASS 208
111 3,900,386
139 3,900,387
143 3,900,388
188 3,900,389
210 3,900,390
370 3,900,391
CLASS 209
73 3,900,107
241 3,900,392
399 3,900,393
CLASS 210
7 3,900,394
80 3,900,395
94 3,900,396
128 3,900,397
196 3,900,398
236 3,900,399
238 3,900,400
3,900,401
321 3,900,402
350 3,900,403
CLASS 211
46 3,900,108
60T 3,900,109
113 3,900,110
148 3,900,112
177 3,900,111
CLASS 212
35HC 3,900,113
83 3,900,114
CLASS 214
1Q 3,900,115
10.5R 3,900,116
18R 3,900,117
84 3,900,118
86A 3,900,119
CLASS 215
1C 3,900,120
12R 3,900,121
31 3,900,122
216 3,900,123
291 3,900,124
341 3,900,125
CLASS 219
10.55D 3,900,713
229 3,900,714
CLASS 220
75 3,900,126
216 3,900,127
269 3,900,128
306 Re.28,521
3,900,129
378 3,900,130
CLASS 221
169 3,900,131
251 3,900,132
280 3,900,133
CLASS 222
52 3,900,134
3,900,135
70 3,900,136
309 3,900,137
340 3,900,138
402.24 3,900,139
CLASS 224
5V 3,900,140
CLASS 226
53 3,900,141
100 3,900,142
CLASS 227
109 3,900,143
155 3,900,144
CLASS 228
4.1 3,900,145
103 3,900,146
107 3,899,825
3,900,147
3,900,148
122 3,900,149
185 3,900,150
220 3,900,151
221 3,900,152
246 3,900,153
CLASS 229
1.5R 3,900,154
7R 3,900,155
14C 3,900,156
16D 3,900,157
17S 3,900,158
69 3,900,159
71 3,900,160
87B 3,900,161
CLASS 235
61.11C 3,900,717
61.11E 3,900,716
61.7R 3,900,715
150.51 3,900,718
150.52 3,900,719
151.32 3,900,720
152 3,900,722
156 3,900,721
3,900,723
164 3,900,724
CLASS 239
102 3,900,162
112 3,900,163
222 3,900,164
375 3,900,165
CLASS 240
7.5 3,900,725
41.35R 3,900,726
3,900,727
52R 3,900,728
136 3,900,729
CLASS 242
43 3,900,166
84.2A 3,900,167
118.32 3,900,168
194 3,900,169
198 3,900,170
3,900,171
3,900,172
201 3,900,173
209 3,900,174
CLASS 244
3.13 3,900,175
6 3,900,176
53R 3,900,177
55 3,900,178
CLASS 248
287 3,900,179
288 3,900,180
340 3,900,181
CLASS 249
24 3,900,182
68 3,900,183
CLASS 250
199 3,900,404
206 3,900,730
207 3,900,731
231SE 3,900,732
262 3,900,733
311 3,900,734
324 3,900,735
468 3,900,405
492A 3,900,736
3,900,737
560 3,900,738
CLASS 251
6 3,900,184
CLASS 252
8.55C 3,900,406
8.57 3,900,407
12.6 3,900,408
48.8 3,900,409
51.5R 3,900,410
52R 3,900,411
62.1P 3,900,414
62.1 3,900,412
3,900,413
62.51 3,900,415
63.7 3,900,416
300 3,900,417
301.2R 3,900,418
301.2W 3,900,419
307 3,900,420
312 3,900,421
344 3,900,423
426 3,900,422
428 3,900,424
430 3,900,425
439 3,900,426
455R 3,900,427
462 3,900,428
3,900,429
463 3,900,430
501 3,900,431
519 3,900,432
CLASS 254
139.1 3,900,185
CLASS 259
21 3,900,186
192 3,900,187
3,900,188
CLASS 260
2.5B 3,900,433
17R 3,900,434
17 3,900,435
18PN 3,900,437
18N 3,900,436
28.5AS 3,900,439
28.5R 3,900,438
29.7W 3,900,440
31.8HA 3,900,441
42.46 3,900,442
45.75P 3,900,444
45.8NT 3,900,443
47ET 3,900,445
75NT 3,900,446
75S 3,900,527
77.5AM 3,900,447
78UA 3,900,449
78R 3,900,448
3,900,450
79.5NV 3,900,451
80.78 3,900,452
86.1E 3,900,453
88.2R 3,900,454
92.8W 3,900,455
94.3 3,900,456
94.9D 3,900,457
112R 3,900,458
157 3,900,459
160 3,900,460
209D 3,900,461
209R 3,900,462
231CM 3,900,463
239.1 3,900,464
239.3B 3,900,466
239.3P 3,900,465
239.55C 3,900,467
243C 3,900,468
243R 3,900,469
3,900,470
246B 3,900,471
247.1A 3,900,472
250Q 3,900,473
256 3,900,474
256.4C 3,900,475
256.4Q 3,900,476
288CF 3,900,477
293.64 3,900,479
293.69 3,900,480
293.77 3,900,481
293.8 3,900,478
294.8G 3,900,482
294.9 3,900,483
296T 3,900,494
301 3,900,484
302D 3,900,485
304 3,900,486
306.7C 3,900,487
3,900,488
307A 3,900,490
307F 3,900,489
307H 3,900,491
308A 3,900,492
309.5 3,900,493
326C 3,900,496
326.11R 3,900,495
327TH 3,900,499
327M 3,900,497
327R 3,900,498
340.7 3,900,500
340.9 3,900,501
397.47 3,900,502
410.7 3,900,503
438.1 3,900,504
448A 3,900,505
448.8A 3,900,506
455 3,900,507
456A 3,900,508
456R 3,900,509
458 3,900,510
465.5R 3,900,511
468D 3,900,513
468K 3,900,512
500.5H 3,900,514
501.17 3,900,515
557R Re.28,525
561N 3,900,516
3,900,517
573 3,900,518
580 3,900,519
586R 3,900,520
592 3,900,521
621A 3,900,523
621H 3,900,522
652.5R 3,900,524
680E 3,900,525
681.5 3,900,526
876R 3,900,528
3,900,529
877 3,900,530
878R 3,900,531
879 3,900,532
897A 3,900,533
3,900,534
945 3,900,535
952 3,900,536
CLASS 261
122 3,900,537
CLASS 264
22 3,900,538
27 3,900,539
29 3,900,540
35 3,900,541
40 3,900,542
45.3 3,900,543
45.5 3,900,544
89 3,900,545
102 3,900,546
117 3,900,547
171 3,900,548
176F 3,900,549
320 3,900,550
CLASS 266
5E 3,900,189
CLASS 267
9B 3,900,190
CLASS 271
3 3,900,191
3.1 3,900,192
85 3,900,193
CLASS 272
1B 3,900,194
57R 3,900,195
CLASS 273
1R 3,900,196
3,900,197
102B 3,900,778
105.4 3,900,198
189A 3,900,199
CLASS 277
235A 3,900,200
CLASS 280
5H 3,900,201
8 3,900,202
11.13S 3,900,204
11.2 3,900,203
11.35E 3,900,206
11.35K 3,900,205
11.35T 3,900,207
16 3,900,208
36C 3,900,209
150AB 3,900,210
3,900,211
406A 3,900,212
407 3,900,213
414R 3,900,214
CLASS 282
27.5 3,900,215
3,900,216
3,900,217
3,900,218
CLASS 283
6 3,900,219
CLASS 285
4 3,900,223
177 3,900,220
276 3,900,221
CLASS 293
71P 3,900,222
CLASS 296
23MC 3,900,224
CLASS 297
367 3,900,225
CLASS 299
17 3,900,226
CLASS 303
7 3,900,227
21CG 3,900,228
52 3,900,229
84A 3,900,230
CLASS 305
35EB 3,900,231
CLASS 307
41 3,900,739
112 3,900,740
204 3,900,741
211 3,900,742
221D 3,900,743
235R 3,900,744
260 3,900,745
264 3,900,746
304 3,900,747
CLASS 308
1R 3,900,232
6C 3,900,233
15 3,900,234
235 3,900,235
CLASS 310
9.6 3,900,748
156 3,900,749
CLASS 312
217 3,900,236
CLASS 313
44 3,900,750
60 3,900,751
188 3,900,752
198 3,900,753
221 3,900,754
317 3,900,755
354 3,900,756
402 3,900,757
485 3,900,758
CLASS 315
10 3,900,759
17 3,900,760
60 3,900,761
111 3,900,762
156 3,900,763
365 3,900,764
411 3,900,765
CLASS 316
20 3,900,237
CLASS 317
3 3,900,766
61.5 3,900,767
96 3,900,768
101DH 3,900,769
148.5B 3,900,770
250 3,900,772
258 3,900,773
3,900,774
3,900,775
262A 3,900,776
CLASS 318
39 3,900,777
197 3,900,779
254 3,900,780
271 3,900,781
634 3,900,782
CLASS 320
2 3,900,783
6 3,900,784
39 3,900,785
CLASS 321
2 3,900,786
15 3,900,787
3,900,788
47 3,900,789
CLASS 323
4 3,900,790
93 3,900,791
102 3,900,792
CLASS 324
40 3,900,793
142 3,900,794
158R 3,900,795
161 3,900,796
CLASS 325
396 3,900,798
CLASS 328
28 3,900,799
129 3,900,797
CLASS 329
122 3,900,821
CLASS 330
15 3,900,800
29 3,900,801
149 3,900,823
CLASS 331
94.5G 3,900,802
94.5P 3,900,803
94.5T 3,900,804
CLASS 333
10 3,900,805
28R 3,900,806
CLASS 335
52 3,900,820
152 3,900,807
210 3,900,808
216 3,900,809
239 3,900,810
268 3,900,822
CLASS 338
2 3,900,811
3,900,812
32R 3,900,813
3,900,814
34 3,900,815
116 3,900,816
157 3,900,817
176 3,900,818
320 3,900,819
CLASS 339
14R 3,900,238
17CF 3,900,239
21R 3,900,240
59M 3,900,241
95R 3,900,242
CLASS 340
15.5AC 3,900,824
15.5TN 3,900,826
15.5TS 3,900,825
18NC 3,900,827
27R 3,900,828
38L 3,900,829
38R 3,900,830
52R 3,900,831
146.3Z 3,900,832
147C 3,900,833
172.5 3,900,834
3,900,835
3,900,836
173R 3,900,837
3,900,838
203 3,900,839
242 3,900,840
258R 3,900,841
310A 3,900,842
347AD 3,900,843
347C 3,900,844
365E 3,900,845
CLASS 343
6R 3,900,846
6.5LC 3,900,867
7PF 3,900,875
7A 3,900,870
7.3 3,900,848
3,900,850
3,900,868
7.7 3,900,869
8 3,900,871
9 3,900,872
12R 3,900,873
16R 3,900,874
18D 3,900,849
105R 3,900,876
108M 3,900,877
112R 3,900,878
113R 3,900,879
228 3,900,880
CLASS 346
1 3,900,866
49 3,900,851
74ES 3,900,852
139R 3,900,853
CLASS 350
6 3,900,243
81 3,900,244
96C 3,900,245
150 3,900,246
3,900,247
160LC 3,900,248
188 3,900,249
CLASS 351
113 3,899,840
160 3,900,250
CLASS 352
12 3,900,251
CLASS 353
39 3,900,252
63 3,900,253
68 3,900,254
CLASS 354
1 3,900,854
29 3,900,855
45 3,900,856
50 3,900,857
79 3,900,858
109 3,900,859
126 3,900,860
209 3,900,861
300 3,900,862
CLASS 355
3DD 3,900,255
14 3,900,256
29 3,900,257
51 3,900,258
CLASS 356
5 3,900,259
3,900,260
3,900,261
28 3,900,262

74	3,900,263
111	3,900,264
200	3,900,265
208	3,900,266
209	3,900,267
CLASS 357	
3	3,900,881
7	3,900,771
17	3,900,863
	3,900,864
30	3,900,865
	3,900,882
32	3,900,883
CLASS 358	
2	3,900,884
8	3,900,885
82	3,900,886
CLASS 360	
18	3,900,887
69	3,900,889
73	3,900,890
76	3,900,888
84	3,900,891
85	3,900,892
99	3,900,893
108	3,900,894
121	3,900,895
CLASS 401	
230	3,900,268
CLASS 403	
292	3,900,269
317	3,900,270
CLASS 404	
68	3,900,271
93	Re.28,522
130	3,900,272
CLASS 415	
88	3,900,273
CLASS 416	
155	3,900,274
CLASS 417	
203	3,900,275
542	3,900,276
CLASS 418	
184	3,900,277
CLASS 423	
9	3,900,551
76	3,900,552
184	3,900,553
235	3,900,554
365	3,900,555
447	3,900,556
580	3,900,557
CLASS 424	
8	3,900,558
22	3,900,559
45	3,900,560
238	3,900,561
248	3,900,562
250	3,900,563
258	3,900,564
274	3,900,565
	3,900,566
319	3,900,567
352	3,900,568
361	3,900,569
CLASS 425	
123	3,900,278
385	3,900,279
392	3,900,280
CLASS 426	
9	3,900,570
15	3,900,571
41	3,900,572
274	3,900,573
	3,900,574
305	3,900,575
311	3,900,576
312	3,900,577
388	3,900,579
417	3,900,580
535	3,900,581
	3,900,582
580	3,900,578
CLASS 427	
3	3,900,583
8	3,900,584
13	3,900,585
19	3,900,586
	3,900,587
	3,900,588
	3,900,589
22	3,900,590
24	3,900,591
34	3,900,639
38	3,900,636
39	3,900,592
53	3,900,593
	3,900,594
55	3,900,595
	3,900,646
58	3,900,596
82	3,900,597
90	3,900,598
97	3,900,599
99	3,900,600
108	3,900,601
115	3,900,602
124	3,900,603
129	3,900,604
137	3,900,605
155	3,900,606
158	3,900,608
166	3,900,609
185	3,900,607
207	3,900,610
214	3,900,611
232	3,900,612
237	3,900,613
248	3,900,660
258	3,900,614
317	3,900,615
385	3,900,616
386	3,900,682
387	3,900,617
390	3,900,618
408	3,900,619
	3,900,620
430	3,900,621
445	3,900,622
CLASS 428	
9	3,900,637
11	3,900,638
36	3,900,640
38	3,900,641
40	3,900,642
	3,900,643
	3,900,644
41	3,900,645
67	3,900,647
71	3,900,648
76	3,900,649
86	3,900,650
	3,900,651
92	3,900,623
	3,900,652
97	3,900,624
110	3,900,625
	3,900,626
114	3,900,627
134	3,900,628
136	3,900,629
155	3,900,630
195	3,900,631
196	3,900,632
204	3,900,633
208	3,900,634
212	3,900,653
213	3,900,635
214	3,900,654
	3,900,655
215	3,900,656
216	3,900,657
220	3,900,658
223	3,900,659
246	3,900,688
250	3,900,661
252	3,900,662
254	3,900,663
269	3,900,664
276	3,900,665
290	3,900,666
292	3,900,667
297	3,900,668
307	3,900,669
308	3,900,670
323	3,900,671
334	3,900,672
339	3,900,673
355	3,900,674
367	3,900,675
372	3,900,676
373	3,900,677
374	3,900,678
378	3,900,679
	3,900,680
379	3,900,681
409	3,900,683
420	3,900,685
421	3,900,684
425	3,900,686
	3,900,687
432	3,900,689
447	3,900,690
451	3,900,691
489	3,900,692
511	3,900,693
513	3,900,694
CLASS 431	
344	3,900,281
CLASS 432	
59	3,900,282

CLASSIFICATION OF DESIGNS

D 1—	15	236,292
D 2—	17	236,293
	351	236,294
D 4—	12	236,295
	21	236,296
D 6—	6	236,297
	22	236,299
	26	236,300
	27	236,301
	31	236,302
		236,303
	67	236,304
		236,305
	85	236,306
	90	236,298
	104	236,307
	114	236,308
	176	236,309
D 7—	6	236,310
		236,311
	43	236,312
	47	236,313
	64	236,314
	76	236,315
	126	236,316
	137	236,317
		236,318
	166	236,319
	187	236,320
D 8—	20	236,321
	35	236,324
	122	236,322
	257	236,323
D 9—	187	236,325
	294	236,326
D10—	23	236,327
	111	236,328
		236,329
D12—	28	236,330
	49	236,331
	62	236,332
		236,333
	103	236,334
	115	236,335
	118	236,336
	155	236,337
	179	236,338
	183	236,339
D13—	IJ	236,340
D19—	75	236,341
	91	236,342
D22—	22	236,343
D23—	6	236,344
	48	236,345
	93	236,346
	97	236,347
	150	236,348
D26—	1B	236,349
	5C	236,350
		236,351
		236,352
		236,353
		236,357
	14A	236,354
		236,356
	J	236,355
D27—	7	236,359
	39	236,358
D29—	19R	236,360
D34—	5CH	236,361
	L	236,362
	15A	236,363
D35—	3	236,364
		236,365
D40—	1E	236,366
D45—	15	236,368
D48—	2	236,369
	3	236,367
	4A	236,370
	32R	236,371
D54—	14	236,372
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